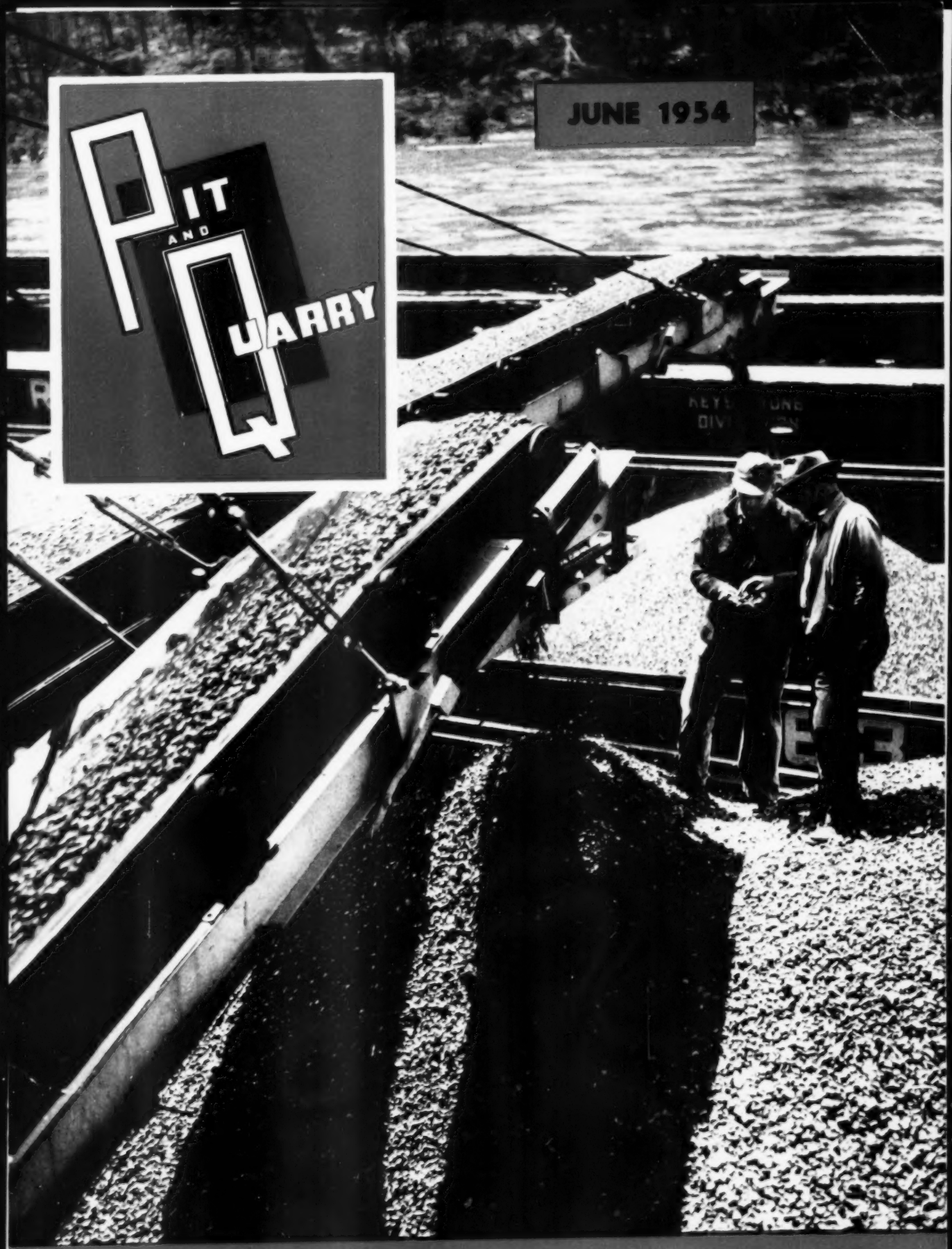
PIT AND QUARRY

JUNE 1954



Barge Loading Scene at H.M.S. Gravel Plant of Dravo's Keystone Division, Pittsburgh, Pa.

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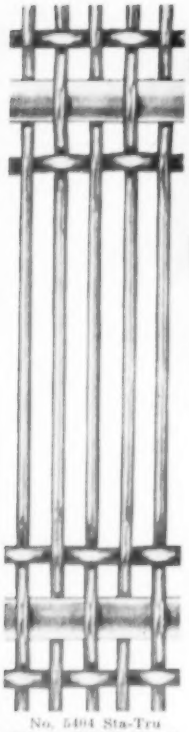
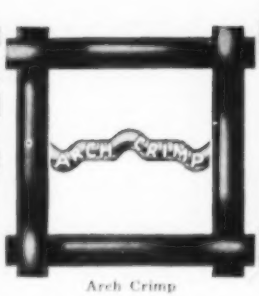
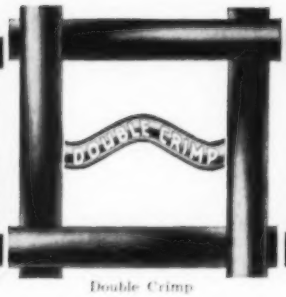


No. 5404 Sta-Tru

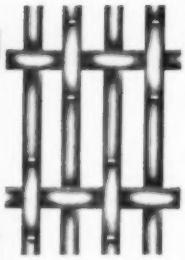


Arch Crimp



Double Crimp

Sta-Smooth



Arch Crimp Rek-Tang

SUPER-LOY

SQUARE OPENING and LONG OPENING WOVEN WIRE SCREENS

withstand abrasion **endure vibration**

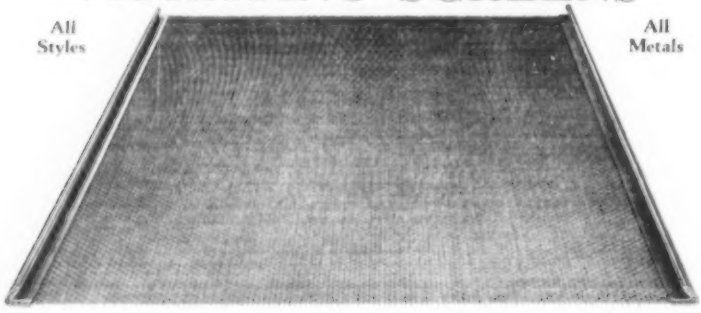
resist fatigue

— o —

HOOK STRIPS FOR VIBRATING SCREENS

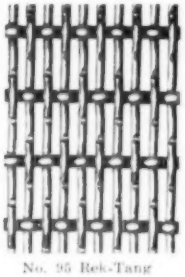
All Styles

All Metals

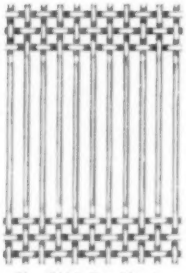


Write for catalog listing square-opening screens and wire cloth carried in stock, and showing full information for ordering special requirements made up to your exact specifications.

Sta-Smooth Rek-Tang

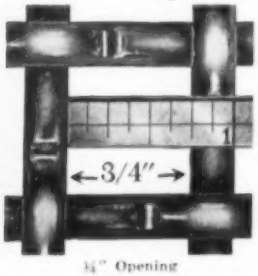


No. 95 Rek-Tang

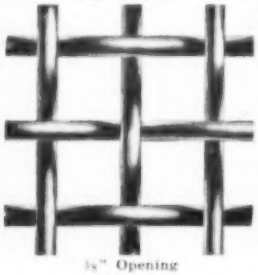


No. 7159 Sta-Clear

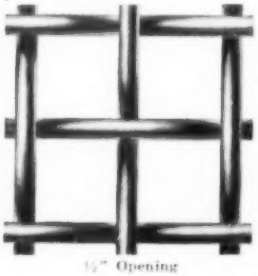
No. 7110 Sta-Clear



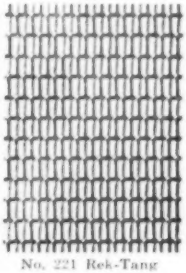
¾" Opening



¾" Opening



1½" Opening



No. 221 Rek-Tang

LUDLOW-SAYLOR WIRE CLOTH COMPANY

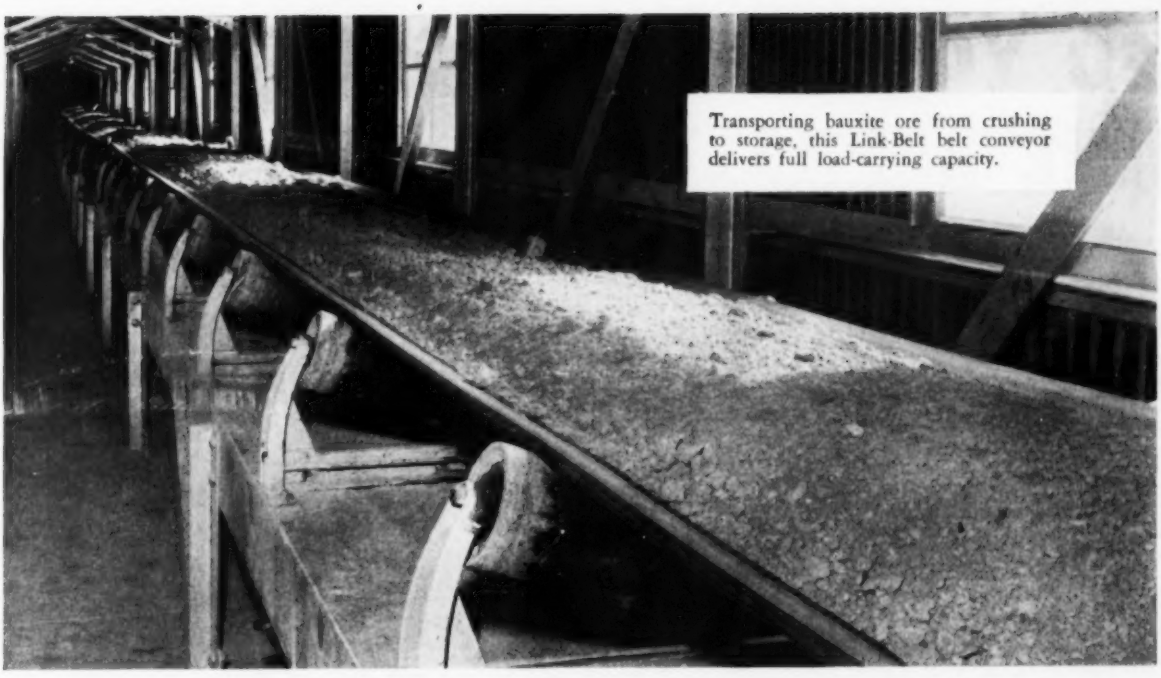
601 South Newstead Ave., St. Louis 10, Mo.

BIRMINGHAM, ALABAMA
921 EUCLID AVE.

CHICAGO 24, ILLINOIS
6 NORTH HAMLIN ST.

PITTSBURGH 19, PENNA.
UNION TRUST BLDG.

STAR WIRE SCREEN & IRON WORKS, INC., 2515 SAN FERNANDO ROAD, LOS ANGELES 65, CALIF., SUBSIDIARY



Transporting bauxite ore from crushing to storage, this Link-Belt belt conveyor delivers full load-carrying capacity.

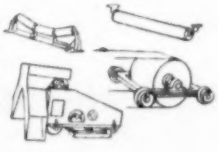
SURE ROAD TO LOWER HANDLING COSTS

... carry the load via Link-Belt belt conveyors

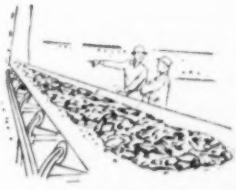
LINK-BELT offers you the "total engineering" so necessary for top efficiency

DESIGNED FOR OVERALL EFFICIENCY—Because of its unrivaled experience, Link-Belt can do a better job of gathering and analyzing all data. Proposals reflect this understanding of the most practical way to fit individual conveyors into your overall system requirements for best results.

BUILT FOR LONG-LIFE PERFORMANCE—Link-Belt manufactures all components and related feeders and conveyors. You are assured of the right equipment because of this breadth of line. And Link-Belt will supply the highest grade belts engineered to the specific job.



DELIVERS FULL RATED CAPACITY—Link-Belt follows through on every detail of the job, including electrical controls and even wiring and foundations. What's more, Link-Belt will furnish experienced erection superintendents, staffs and skilled crews at the customer's request.



ASSURES SATISFACTORY PERFORMANCE—When you rely on Link-Belt as a single source for your complete system, we accept responsibility for placing it in full operating readiness. We will also supervise modernization of existing systems. For all the facts call your nearby Link-Belt sales representative.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13.466-A

PIT AND QUARRY, June, 1954, Vol. 46, No. 12. Published monthly by Pit and Quarry Publications, Inc., 431 South Dearborn St., Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy $0.50. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

SO YOU WANT TO GET INTO THE ASPHALT BUSINESS--

UNIVERSAL Speed Batch . . . push-button control asphalt plant

Two men can operate it — and neither needs to be highly skilled. You have centralized control over the entire plant with electric push-button and pilot control valves. Easy to operate, clearly labeled push-button controls eliminate guesswork and make it a simple matter for the operator to speed up the production cycle.

Minimum investment required — and operating costs are low. You can make a production run or one batch, change mixes as often as you need to with hardly any delay, dry only the exact amount of aggregate to be used. Maintenance cost is low, too, with all parts easy to inspect and adjust.

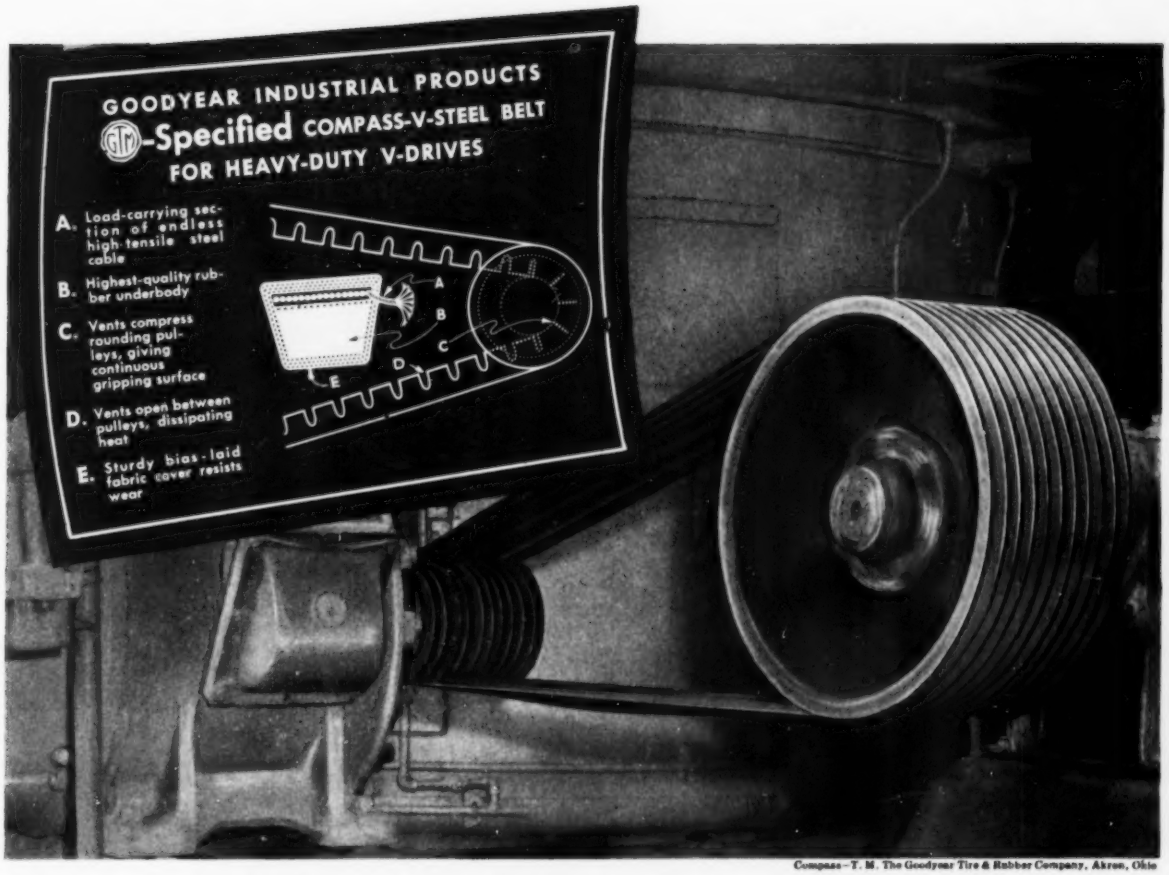
A high quality plant — Like all Universal equipment, the Speed Batch Model 2000 is quality engineered throughout. For example: drying drums are heavily insulated to retain heat and increase plant output; plant is highly portable with dryer, pugmill, dust collector and all power and controls on one sturdy frame — meets highway limitations; piping is simplified, with one connection each to Bitumen and fuel supply lines.

Get full information now — Yes, this is your plant, if you want to get into the profitable asphalt business without a heavy investment. See your Universal distributor or write today for an 8 page illustrated booklet on the Universal Speed Batch Model 2000 Asphalt plant. Write Universal Engineering Corporation, 619 C Avenue, N.W., Cedar Rapids, Iowa.

PETTIBONE
UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION
619 C Avenue, N.W., Cedar Rauids, Iowa

A Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division St. Chicago 51, Illinois



Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

WHY STEEL CABLE

as the load-carrier in V-Belts?

BECAUSE it has negligible stretch, because it has high strength to weight and diameter ratios, because it is unaffected by heat, because it is extremely flexible—these are the reasons for using airplane-type steel cable in the world's most efficient V-Belts—Goodyear's famous COMPASS-V-Steel Belts and larger Steel Cable V-Belts.

The G.T.M. — Goodyear Technical Man — designed these belts for the "belt-killer" drives of all industry—drives where heavy loads, unusually fast or slow speeds, limited space, undue heat or the need for absolute dependability impose service conditions beyond the capacity of ordinary belts.

Greater strength and load capacity at speeds of 10 to 10,000 feet per minute. Fewer belts. Smaller pulleys. Shorter centers. No stretch. No slip. No creep. Highest heat resistance. Minimum maintenance. All these advantages of steel cabled belts have been proved on over 5,000,000 critical drives. Details? Write Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

Farbizo Coal Co., Dover, Ohio

2 Years Old!...16,280 Hours!...No Repairs! ...Oil Consumption Unchanged! With Cities Service DC-330 Oil

ONE OF FARBIZO'S GRADALLS has done an outstanding job on a 38 core slag pit. Cities Service DC-300 oil keeps Farbizo's hard-working Gradall shovel in top shape.

IN THEIR TD 24 BULLDOZER TOO. Farbizo relies on heavy duty, high detergent Cities Service DC-300 oil. Heat-resistant, long-lasting and free-flowing DC-300 does the finest job possible.

Twin G.M.C. Diesels in Marion Shovel Give Outstanding Performance!

Here's the story from the Farbizo Coal Co.:

"Following are the pertinent facts with reference to the Marion 111 M Shovel using DC-330 Oil since January, 1951:

"Developed ample power with TWIN G.M.C. Diesels operating at 1550 R.P.M. Operated 16,280 hours with no motor breakage or repairs. Mined 203,000 tons of #5 coal from 36" seam with an average over burden of 35 feet hard pan shale with streaks of iron ore bands.

"Oil consumption 1 pint per week, oil and filters changed weekly. Consumption is same as when shovel was new. Motors were recently inspected but no repairs or replacements needed. Unusual performance praised by G.M.C. and Marion Shovel representatives.

"Similar results using DC-300 Oil in two Gradall shovels and International TD 24 Bulldozer."

Let Cities Service lubricants protect the important investment you have in your machinery. Call your nearest Cities Service representative or write Cities Service Oil Co., Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

YOU THINK YOUR DIGGING PROBLEMS ARE TOUGH

HERE'S as tough a bit of mining as ever tested out a shovel. This is Kyanite, an aluminum silicate used in ceramics to offset the shrinking of clays.

Kyanite is hard — often reaching a hardness of 7.

Northwests have the stamina for mining operations like this. The Northwest Dual Independent Crowd utilizes force most other independent crowds waste, giving that extra push for hard rock work. The "Feather-Touch" Clutch Control makes operation easy without pumps, compressors, valves, or tubing. The Cushion Clutch eliminates overloads before they can damage operating machinery. Cast steel bases and machinery side frames take the shocks of rock digging. Uniform Pressure Swing Clutches eliminate the jerks and grabs that make spotting heavy loads difficult. These and many other Northwest advantages combine to make the Northwest a *real* Rock Shovel.

If you have a pit problem or are modernizing get complete details on Northwest equipment. Ask to see a Northwest Man.

NORTHWEST ENGINEERING COMPANY
1515 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

● Perhaps your problem calls for rubber tired equipment. Don't buy a Truck Crane 'till you have the whole story on the Northwest.

NORTHWEST

Convertible for any Mining Material Handling or Excavation Problem

LONGER "TROUBLE-FREE" SERVICE is the proved record of Anaconda's Securityflex SH-D Shovel Cable in mines like this, the world over.

How AnacondA SH-D Shovel Cable helps keep downtime DOWN

A cable breaks. A shovel lies idle. Production time and profits slip away.

One break in a cheap cable can more than wipe out savings made by buying on price alone.

A far wiser buy is Anaconda's improved Securityflex* Type SH-D Shovel Cable. This rugged cable is built to keep downtime down!

Why mine superintendents praise it

A new, high-grade butyl insulation withstands heat, moisture and ozone. New neoprene jacket is tougher and more abrasion resistant. Rubber cores cushion the ground wires . . . help prevent breaks.

Run Securityflex Shovel Cable over rocks—if you must. See how it holds up. Securityflex is flexible . . . easy to handle . . . safer . . . less liable to "blow-out."

Try Securityflex in your mine

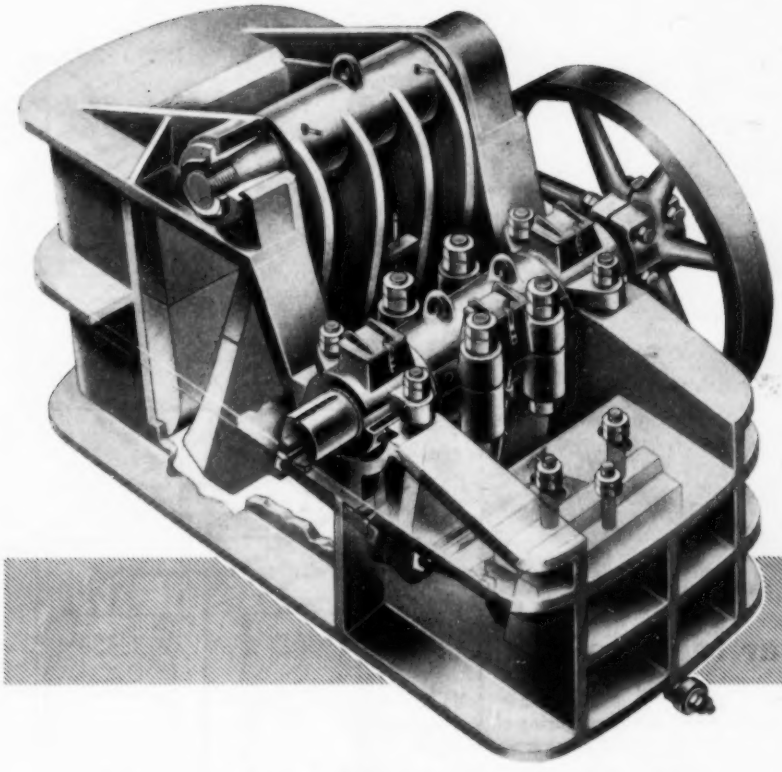
Securityflex Type SH-D Shovel Cable has a proved record of safety and economy in mines all over the world. Chances are it can cut downtime and costs in *your* mine, too. See your Anaconda Sales Office or Distributor for further information. *Anaconda Wire & Cable Co., 25 Broadway, N. Y. 4, N. Y.*

*Reg. U. S. Pat. Off. 5432

ANACONDA®

Flat-twin cables for shuttle cars, continuous miners, loaders, cutters, drill trucks. Hi-volt cables for mine power • Type SH-D for shovels • Type SO and heavy-duty drill cords for hand drills, remote control • trolley wire • feeder cable • telephone wire • shot fire cord • welding cables.

this "bottleneck" boosts production!

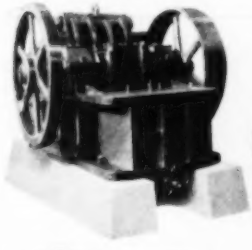


The production capacity of a quarry depends upon the output of the crusher. Poor crusher performance creates a "bottleneck". One sure way to relieve this "bottleneck" is to employ crushers built for greater efficiency and dependability in operation. Traylor Jaw Crushers use their curved crushing surfaces to ease the squeeze on your production bottleneck.

Get more production . . . cut down time . . . with curved jaw plates. Primary reason for the steady production of Traylor Jaw Crushers is their original curved jaw plates. These surfaces outwear conventional plates by as much as 3 to 1 because of the scientific application of crushing power. Also, with Traylor's curved jaw plates, a finer product in greater capacity is secured, at no increase in power. IN FACT, TRAYLOR CRUSHERS REQUIRE LESS POWER PER TON OF ROCK CRUSHED THAN ANY OTHER JAW CRUSHER.

TYPE H AND HB

Traylor Type H and HB Crushers offer capacities ranging from 4 to 210 tons per hour (Type H) and from 120 to 640 tons per hour (Type HB). Bulletin 4105 gives complete specifications and details on all the features of both the H and HB Jaw Crushers. Send this coupon for your copy today.

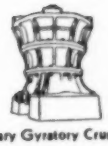


A Traylor LEADS TO GREATER PROFITS

TRAYLOR ENGINEERING & MFG. CO.
656 Mill St., Allentown, Pa.
Sales Offices: New York • Chicago • San Francisco
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P.Q.

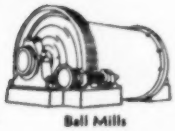
Send complete information on H and HB Jaw Crushers immediately.

Name: _____
Position: _____
Company: _____
Address: _____ State: _____


Primary Gyratory Crushers

Rotary Kilns

Secondary Gyratory Crushers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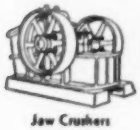
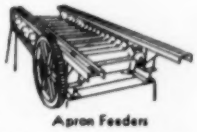
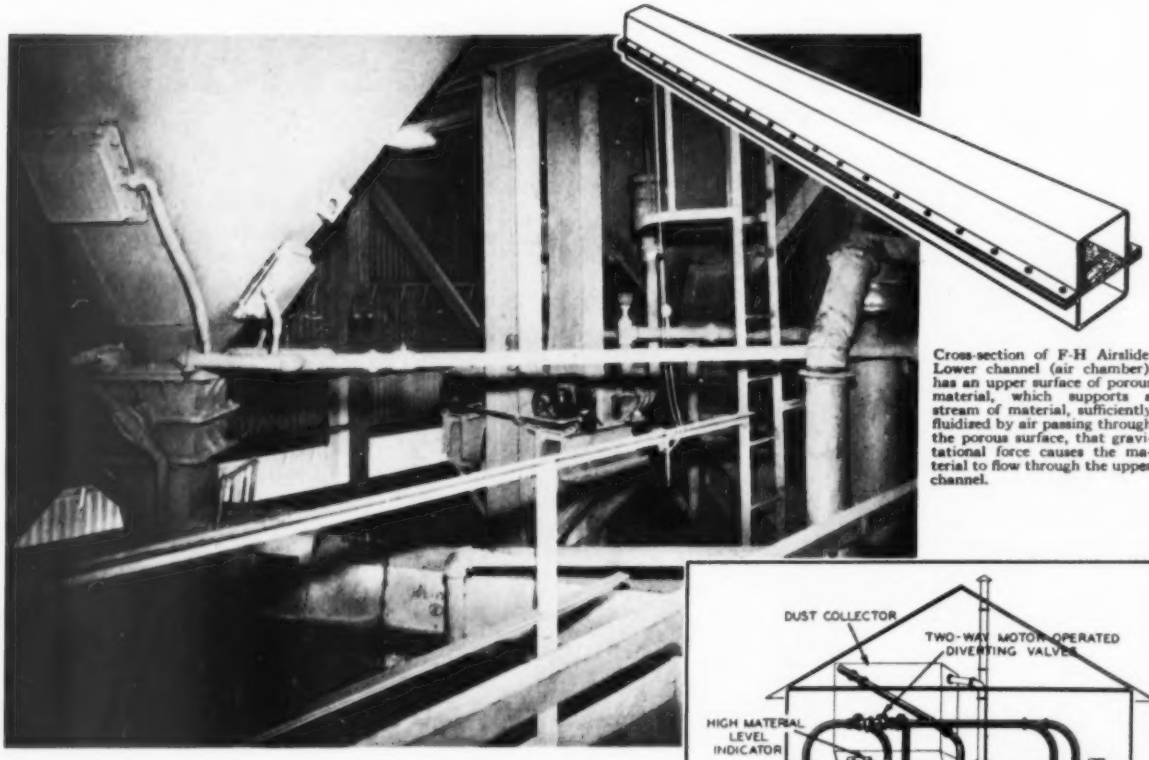
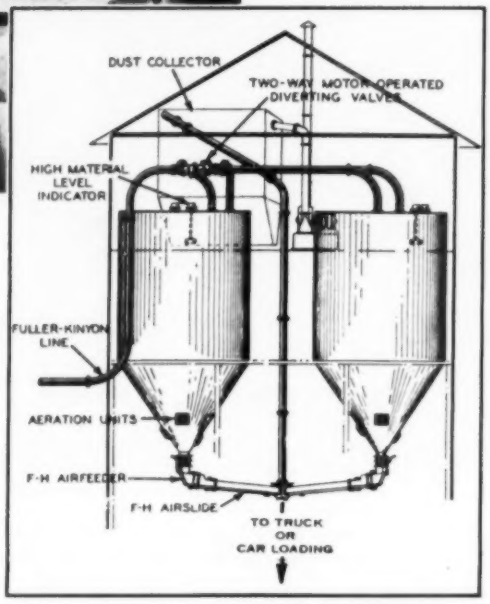

Jaw Crushers


Apron Feeders

Meet the F-H AIRSLIDE® . . .
get acquainted with its possibilities



Cross-section of F-H Airslide. Lower channel (air chamber), has an upper surface of porous material, which supports a stream of material, sufficiently fluidized by air passing through the porous surface, that gravitational force causes the material to flow through the upper channel.



For truck and car loading

F-H Airslides have many possibilities . . . can be applied to the conveying of many dry, fine materials in industrial plants where application of other types of conveyors are impractical. They can be placed overhead, around corners to by-pass equipment installed, and other obstructions in a plant.

Illustrated is a good example of how Airslides can be used to convey dry, pulverized materials from storage bins for truck or hopper-bottom car loading. Clean, safe, fast loading, with a minimum of horsepower. Air-slides eliminate moving, hazardous parts so prevalent in many other types of conveyors . . . no lubrication; time out for breakdowns and repairs reduced to the minimum; production losses cut to the bone.

Write for Bulletin FH-2, illustrating and describing the many ways this modern conveyor can be applied to various conveying problems.

Fuller
CONVEYS BY AIR
. . . NOTHING MOVES BUT THE MATERIAL

FULLER COMPANY—CATASAUQUA, PA.

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DRY MATERIAL CONVEYING SYSTEMS AND COOLERS •
COMPRESSORS AND VACUUM PUMPS •
FEEDERS AND ASSOCIATED EQUIPMENT

FH-38
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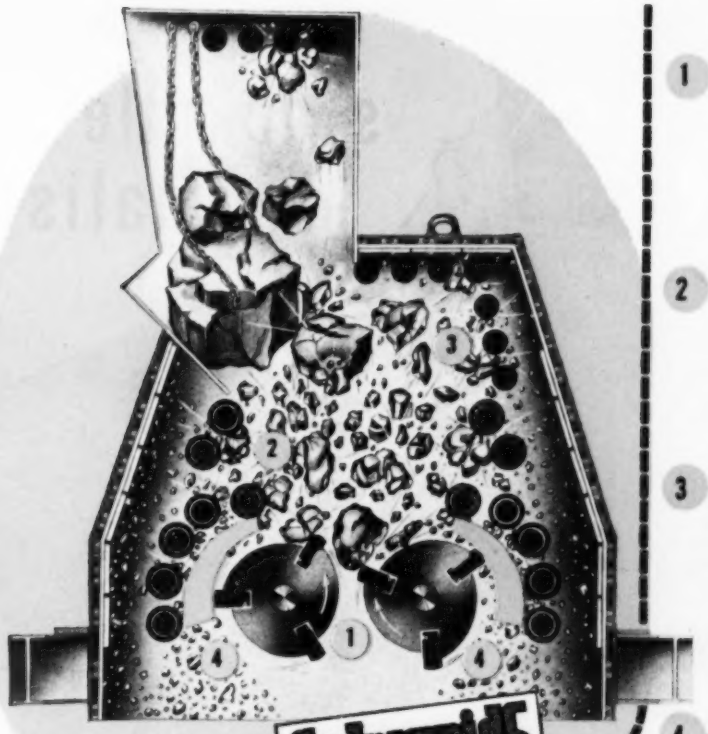


Cedarapids

Built by IOWA

Here's why DOUBLE IMPELLER IMPACT BREAKERS* produce such high tonnages at such low costs

These are a few of the reasons Cedarapids Double Impeller Impact Breakers are unbeatable when it comes to breaking daily tonnage records, with the low maintenance that assures a nice profit on every job.

Add the simple design of these units (only two easily accessible moving parts) to the low power consumption and really big-volume output of cubical shaped aggregate. It's easy to see why more and more contractors are turning to Cedarapids Double Impeller Impact Breakers for money-making production.

See your Cedarapids distributor for complete details about *all* Double Impeller Impact Breaker features.

1 Impellers rotate in opposite directions

Rock is directed *upward and outward* to utilize the entire breaking chamber for big volume production. With impellers rotating in opposite directions, there's no possibility of one impeller throwing rock into the other, putting a greater load on it and causing excessive wear on the impeller and impeller hammers.

2 Breaks rock against rock

Rock fed from the top of the unit is struck by rock hurled upward at terrific speed and is broken in suspension. There's approximately 50% less contact of stone on metal, thus reducing wear on hammers and breaker bars. Load on the impellers is greatly reduced. Reduction ratios of 40 or 50 to 1 are common.

3 Absolute control of product size

Location of breaker bars prevents rock from crashing between the bars and into the end plate of the unit. Rock ricochets off the breaker bars or another rock and is controlled in the breaking chamber by adjustable bars until it's the proper size for discharge. By varying the relative speed of the impellers, fine material can be discharged from one side of the unit and coarse material from the other side.

4 True impact action

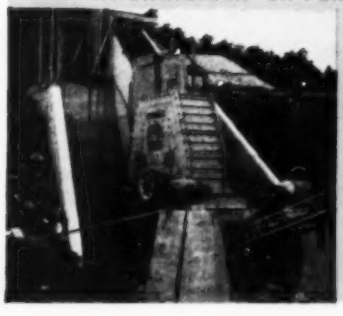
There's no pressure crushing because there's no "nip" in the discharge area. The discharge opening is wider at the discharge end to eliminate any possibility of scrubbing action or crushing by pressure that result in excessive wear and high power consumption. Breaking is accomplished only by impact of rock against rock and against hammers and breaker bars.

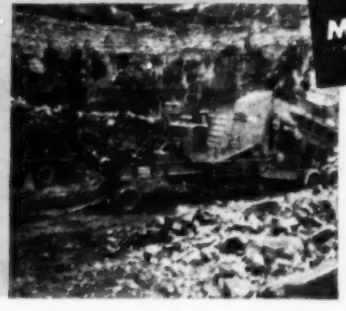
Produces highest quality aggregate

Cedarapids Double Impeller Impact Breakers meet increasingly rigid specifications by producing ideal cubical aggregate *with flat or elongated particles reduced from 10% to 1-1/2% or 2%*, and most soft stone is eliminated. Finished products range from dust up to minus 6", depending upon the nature of the material, operating conditions and the model breaker used.

With its high ratio of reduction, one Double Impeller Impact Breaker often does the work of two crushers of other types. In many cases it is used for simultaneous primary and secondary reduction, thus reducing the need for auxiliary secondary crushers, screens, conveyors, etc.

SIX SIZES PRODUCE FROM 50 TO 1000 TONS PER HOUR IN STATIONARY OR PORTABLE APPLICATIONS



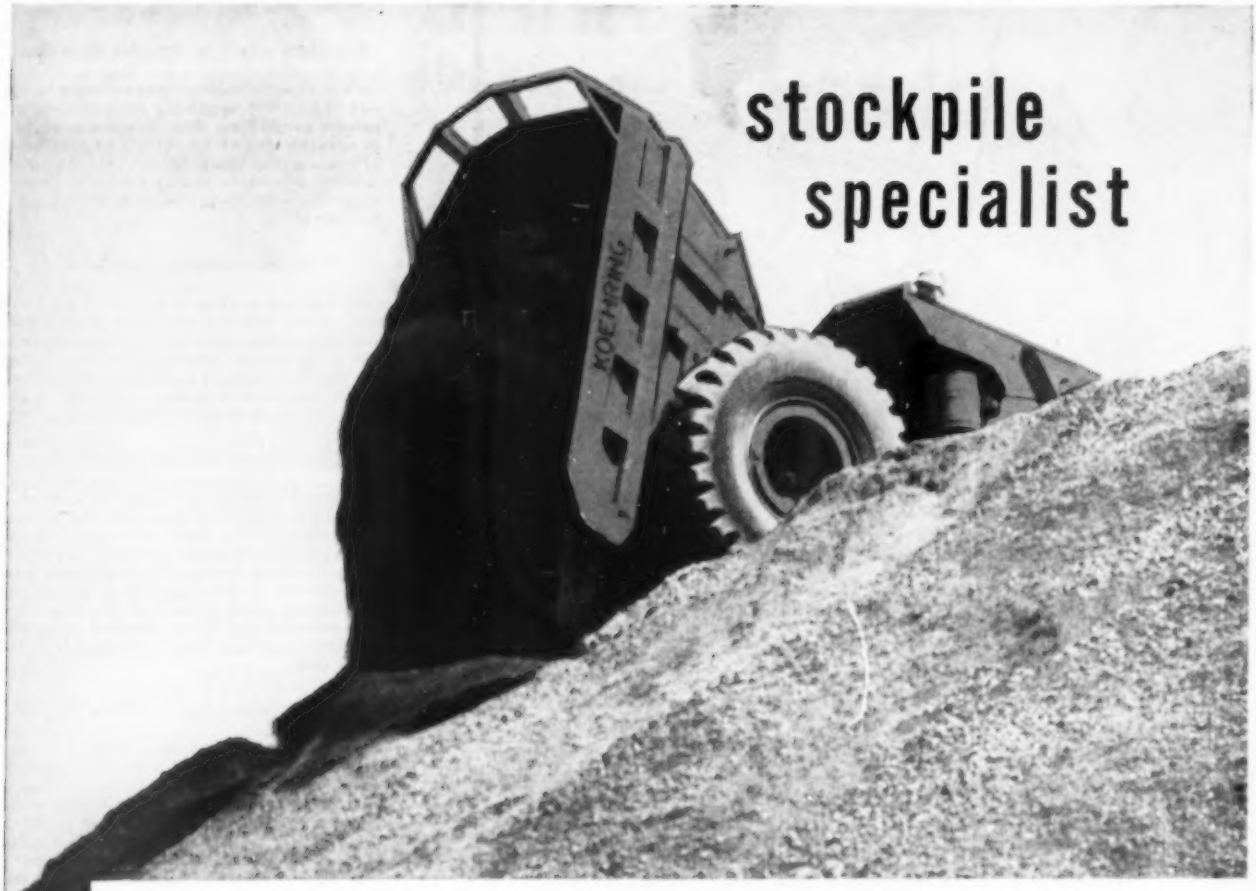


IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA, U.S.A.

IOWA ALSO MANUFACTURES
a complete line of ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND CONTINUOUS MIX TYPE BITUMINOUS MIXING PLANTS • DRIERS • DUST COLLECTORS • HAMMERMILLS • WASHING PLANTS • MOTORIZED HEAD PULLEYS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

*U.S. Pat. No. 2371691, 2486421, 2525795, 2555043, 2605035, 2605074 Canada No. 439371, Mexico No. 44981, Argentina No. 60757 Brazil No. 52941.

stockpile specialist



KOEHRING 6-yard DUMPTOR®

puts stockpiling on a fast, shuttle-haul basis. There's no need to turn at the loader, or on top of the pile, because constant-mesh transmission gives full-speed travel in either direction. This no-turn advantage saves at least 2 slow turns on every trip . . . cuts 30 seconds off normal cycle time.

To dump, operator drives up to edge of stockpile, trips the body-release lever . . . and the gravity-dump body instantly tilts 70°. Fast dumping action kicks the load out over edge of bank, saves a lot of dozer clean-up on the pile. There's no 15 to 25-second wait for slow-acting body hoists. What's more, gravity-dump never balks, never wears out.

Let your Koehring distributor show you what these practical Dumptor advantages can mean in increased production and lower costs on your stockpiling and other off-road hauling jobs.

CH438

KOEHRING COMPANY, Milwaukee 16, Wisconsin (SUBSIDIARIES . . . .

Stockpiling operation (above) shows typical no-turn shuttle advantage. Dumptor drives up to the edge of stockpile, body forward . . . dumps, and heads back for the next load, without turning.

From top of stockpile, Dumptor returns to loader via access ramp . . . or, as shown at left, can continue on down side of stockpile after dumping load. (Climbs 24% grades fully loaded.)

Big, square body opening permits loading over ends or sides by shovel, dragline, or conveyor. Dumptor pulls up, loads, drives away . . . without making a turn.

. . JOHNSON • PARSONS • KWIK-MIX)

CENTRAL CEMENT FEED

prevents gumming

reduces dusting

pre-shrinks materials

Johnson Concentric Batcher provides these practical advantages for fast, economical weigh-batching of aggregates and cement:

- Concentric arrangement of aggregates around the cement batcher discharge gives central cement feed. This prevents "gumming", reduces dusting, pre-shrinks materials. All ingredients are intermingled as they flow through discharge.

- Cement, concrete's most expensive ingredient, is weighed individually on a precision-beam scale, in a separate batcher hung within the aggregate hopper.

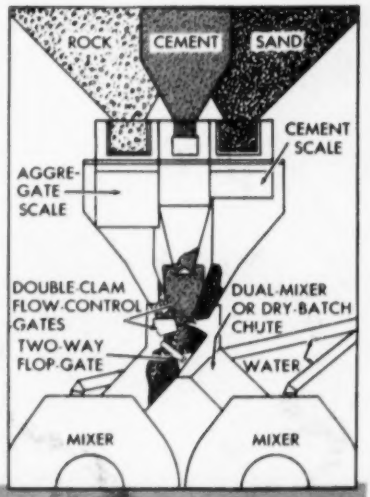
- Adjustable rate of discharge on cement permits extremely accurate ribbon-feeding. Semi-automatic cement arrangement cuts off just ahead of final weight.

- Aggregates are weighed on accumulative dial scale, or on individual weigh-beam scales.

- Two-way discharge with dual chutes are available for charging 2 stationary mixers, or for charging into 1 stationary mixer and a truck-mixer, or dry-batch truck.

- Concentric Batcher sizes range from 2 to 8 cu. yds., and can be arranged for 2 to 8 aggregates — plus 1 to 4 types of cement. Choice of controls: fully automatic air-ram operated, semi-automatic, or manual, to best suit your needs.

Let your Johnson distributor show you all the other production advantages you will get with one of these patented Concentric Batchers in your plant. See him, or write to us.



22

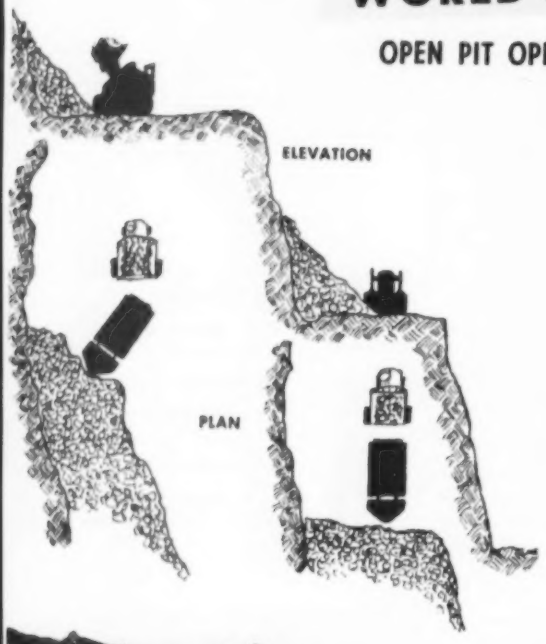
(Koehring Subsidiary) **C. S. JOHNSON CO., CHAMPAIGN, ILL.**

CONCRETE PLANTS • BINS • RECEIVING HOPPERS • ELEVATORS • SILOS • BUCKETS

EIMCO

WORLD'S FINEST TRACTOR-EXCAVATOR

OPEN PIT OPERATIONS INCREASE PRODUCTION WITH SMALL INVESTMENT



Eimco 105 tractors with excavating RockerShovel attachment are being used in open pit mining with extraordinary results:

Loading time 6 yd. truck ..... 45-50 secs.

Average payload per truck ..... 10 tons

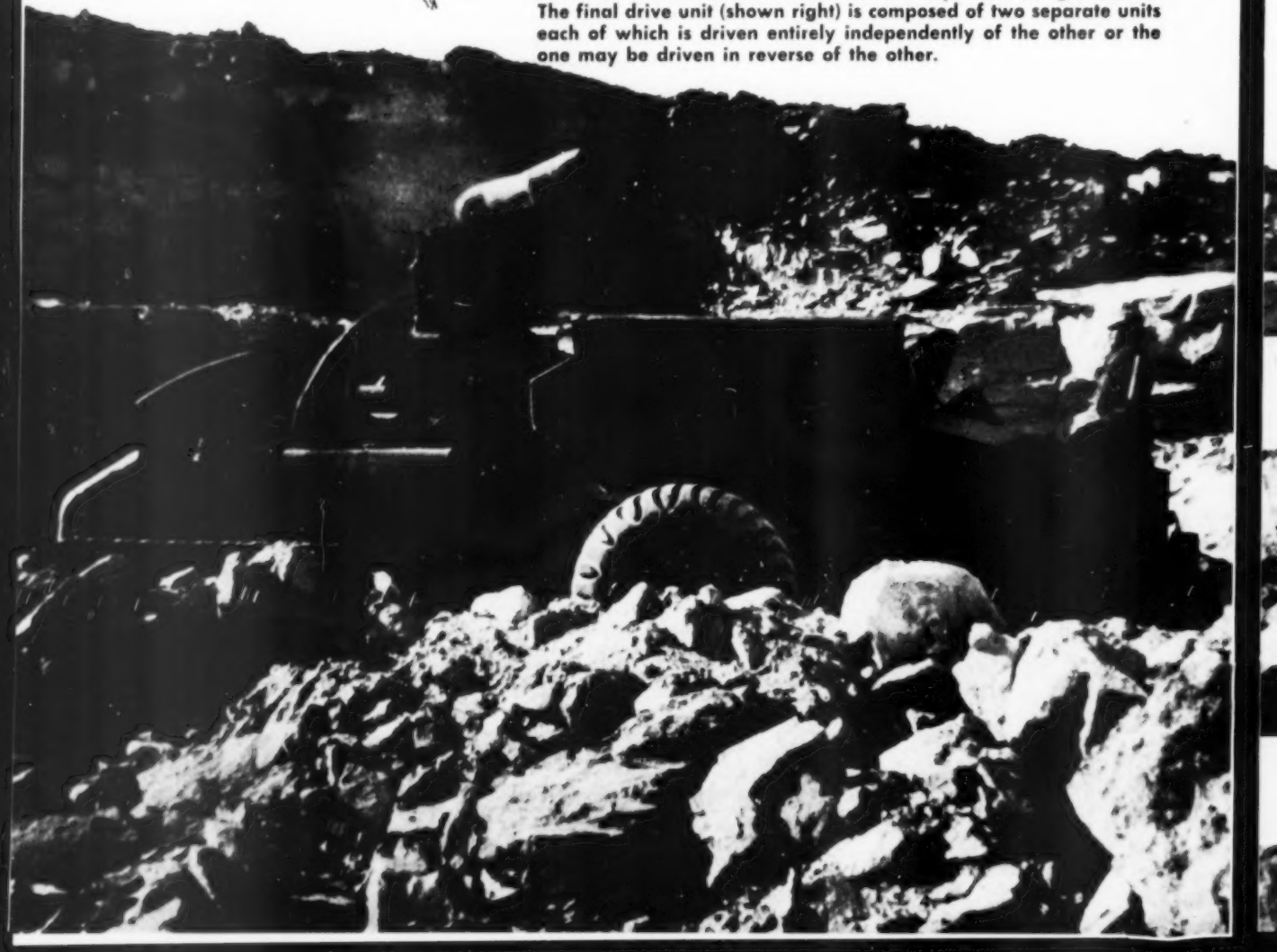
Based on 50 min. hr. and half minute switching time for trucks average hourly production..... 400 tons

Exceptional loading in many operations has shown even greater tonnage figures where material handled was from stock pile and haulage traffic was not confined to narrow roadways such as encountered in benches of open pit systems.

Eimco 105's are in use by contractors in tunnels and on new construction, rock quarries, underground mining, steel mills and on many other jobs. Where speed and dependability are essential the 105 has proved to be the most rugged piece of equipment ever used.

The exceptional features of the 105 make it the finest piece of equipment of its type ever produced. The Unidrive transmission which contains all clutches and gearing for instant reversal, independent track control and gear changing without stopping are indicative of the new approach to heavy prime moving equipment.

The Eimco 105 final drive is another important design feature. The final drive unit (shown right) is composed of two separate units each of which is driven entirely independently of the other or the one may be driven in reverse of the other.



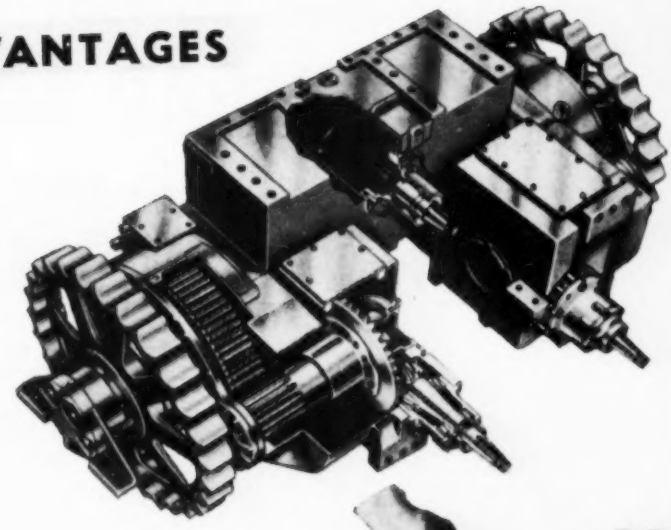
WITH COST SAVING ADVANTAGES

These final drives are each powered through matched pinion, ring gear sets through heavy, short shafts, husky pinions and gears. Even the short shafts are heavier in construction and larger in diameter than similar shafts used in any large tractor on the makert today. Shafts roll in Timken bearings that are separately caged for easy access, perfect alignment and long life. All clutches and brakes in final drive are eliminated. Gear cases are heavy alloy cast steel. Sprockets, gears and other parts are specially heat-treated for long service life.

Additional exclusive featuers include full oscillating tracks even with the excavator attachment. Easy simple controls, torque converter drive, full visibility with operator up front, all steel construction, clutches that never need adjustment.

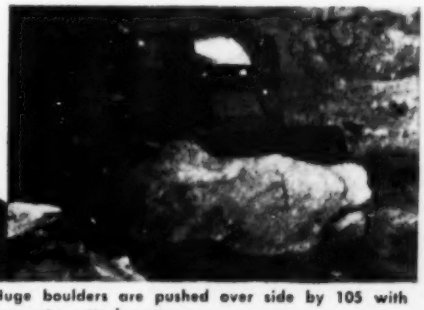
These are the unique features that make the 105 the most maneuverable heavy tractor on the market.

We invite you to see, operate and compare the 105 with any other crawler prime mover. Write for information to The Eimco Corporation, P. O. Box 300, Salt Lake City, Utah, or to any Eimco branch.



The bevel gear on the final drive pinion shaft. This is an example of the husky construction of all 105 parts.

Loading trucks on the pit bench. 105's maneuverability permits trucks to stay in close.

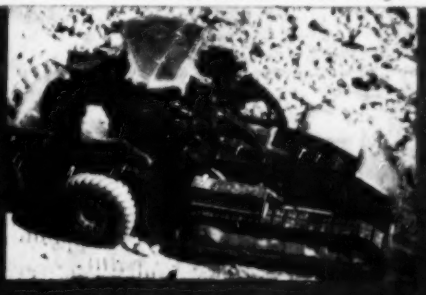


Huge boulders are pushed over side by 105 with excavator attachment.

The 105 picks up and loads larger pieces than can be handled by 1½-2 yard conventional shovels.

105 picks up load and waits for truck to position itself then —

A pull on the lever and over it goes. Heavy duty trucks can be loaded fast, with the bucket in high.



Less rugged equipment can be loaded easily with the bucket in low speed.

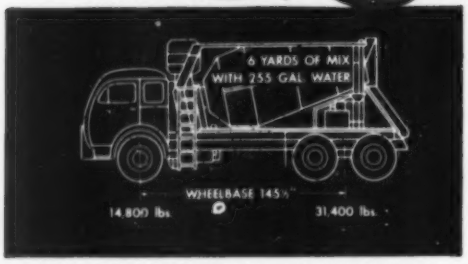
THE EIMCO CORPORATION

Export Offices: Eimco Bldg., 52 South St., New York City • Salt Lake City, Utah—U.S.A.

Branches • New York, 51-52 South Street • Chicago, 301 So. Hicks Road, Palatine, Ill. • El Paso, Texas • San Francisco, 637 Cedar St., Berkeley, Cal. • Birmingham, Ala., 3140 Fayette Ave. • Duluth, Minn. • Kellogg, Ida.

B-40

NEW PAYLOAD ADVANTAGE
in this
WHITE 3000 SIX-WHEELER



SPECIFICATION BRIEFS ON THIS WHITE 302264

Mixer mounted 15 inches from back of cab. 145½ inch wheelbase. 10.00 x 20, 12-ply lug tires on rear, 11.00 x 20 four-ply wire-cord on front. Mustang Engine, 14 inch clutch, 507-B transmission, White 87-C tandem axle with 6.83 to 1 ratio. 12-volt battery system, Aeromatic power steering. Mixer starter motor mounted at rear driven from battery.

TOMORROW'S TRUCK TODAY in mixer service is this White 3000 Six-Wheeler that brings new earning power . . . new efficiency and economy to the ready-mix industry.

Drivers have glowing reports of the great job this White 3000 is doing everywhere. This six-wheeler with 5½-yard mixer is hauling 6 yards of mix, 175 gallons of water in mixing drum and 80 gallons of water in flush tank. It is an amazing story of correct application for more payload profits!

Get facts from your White Representative without delay.

THE WHITE MOTOR COMPANY

Cleveland 1, Ohio

For More Than 50 Years

The Greatest Name In Trucks

Pit and Quarry

Rust-proof your air tools

with GULF ROCK DRILL OIL

OTHER REASONS WHY YOU'LL LIKE IT—

1. Nongumming
2. High film strength
3. Atomizes readily
4. Covers completely
5. Has low pour point

Yes, you insure freedom from rust when you use Gulf Rock Drill Oil for air operated tools—it contains an effective corrosion inhibitor which keeps moving parts clean as a whistle.

Gulf Rock Drill Oil also has exceptional resistance to oxidation—does not form gummy deposits on internal surfaces of air tools.

Then too, Gulf Rock Drill Oil provides outstanding protection against wear. It has good surface wetting ability—covers completely—and has unusually high film strength.

Gulf Rock Drill Oil has the proper viscosity for this service—atomizes properly in air line oilers—and has a very low pour point. Its use insures cleaner tools, fewer repairs, and lower costs for maintenance.

For further information on Gulf Rock Drill Oil and for expert help on the lubrication and maintenance of other types of quarry equipment, call in a Gulf Sales Engineer today. Write, wire, or phone your nearest Gulf Office.

GULF OIL CORPORATION
GULF REFINING COMPANY

1822 GULF BUILDING,
PITTSBURGH 30, PA.

GULF

WHY NOT LOAD THE CHEAPEST WAY?

BARBER-GREENE

MODEL

82-A

CRAWLER-MOUNTED BUCKET LOADER

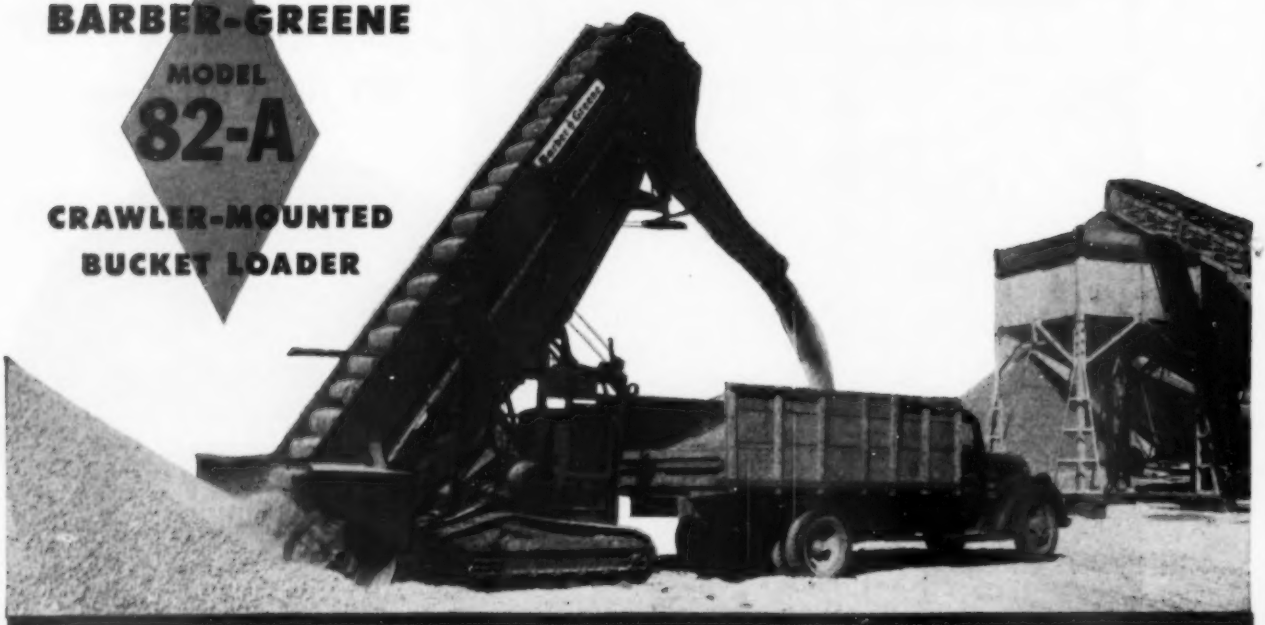


FIGURE CONSIDER COMPARE AND SEE

A B-G 82-A Bucket Loader is by all odds the cheapest and fastest method of loading free-flowing materials into trucks. Exhaustive cost analyses made throughout Barber-Greene's over 30 years' experience (during which B-G Loaders handled over a billion yards of material) have consistently proved this.

In addition, the B-G Constant Flow principle of loading eliminates cycle loading shocks . . . loader is easier to keep in adjustment, cheaper to maintain. Simple controls mean that each driver can load his own truck . . . no need for an expensive operator. Each truck can be loaded to full capacity without spillage . . . without truck damage or undue truck wear. Crawler-mounted, the 82-A provides positive traction in all kinds of going—on soft or muddy bases—on spots where pneumatic-tired rigs can't operate.

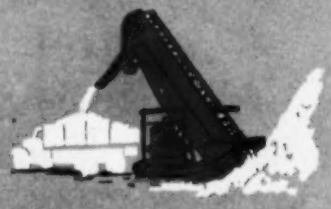
All this means that when you need a B-G 82-A Loader, you can't afford to be without one . . . ask for complete details.

see your **B-G distributor** . . . or write

...ON JOBS LIKE THESE

STOCK PILE LOADING

Here's the most economical, and fastest, way to load bulk materials from stock pile to truck. No backing up, no swinging around, no lost motion whatever—the 82-A steadily eats into the pile, cleaning up as it goes—at less cost per yard than is possible with any other machine or method.

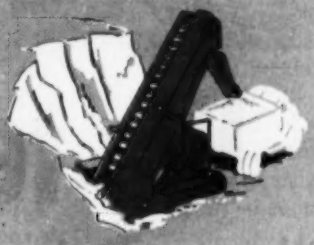


TOPSOIL STRIPPING

Stripping topsoil and loading directly to trucks is another fast, low-cost operation for the 82-A. Special notched topsoil spirals pulverize and "fluff-up" the soil . . . lumps are broken up to give every load the quality of rich, black loam. Close control of grade allows stripping *all* the topsoil down to the subsoil. This close grade control makes the 82-A especially suited to stripping jobs such as dump areas, park paths, highway dividing strips, etc.

BANK LOADING

Your truck fleet will be constantly on the move keeping up with the 3 cu. yd. per min. loading rate of the 82-A as it works the face of a tough gravel bank. It can be equipped with a double-deck vibrating screen to deliver sized aggregate to one truck and scalp oversize to another . . . making screening and loading a simple, simultaneous operation. Close grade control and cleanup scraper leave a clean, level floor.



AND MANY OTHER COST-CUTTING JOBS

WHATEVER the bulk material . . . sand, stone, gravel, coal, ashes, bulk chemicals . . . the B-G Loader will load into trucks faster, at lower cost. And a variety of screening attachments, boom extensions and spouts assures the easy adaptation of the 82-A to all your loading jobs.

WHEREVER your loading operations may be, the wide, long crawlers on the B-G 82-A provide the necessary traction for working on all soft, muddy bases. This means more workable days per season, every season.

WHENEVER you want to save as much as 80% of all truck time compared with intermittent dig and swing loading—

YOU NEED the Barber-Greene Crawler-Mounted Model 82-A Bucket Loader.

Barber-Greene

BG

Aurora, Illinois, U.S.A.

We tear truck axles to

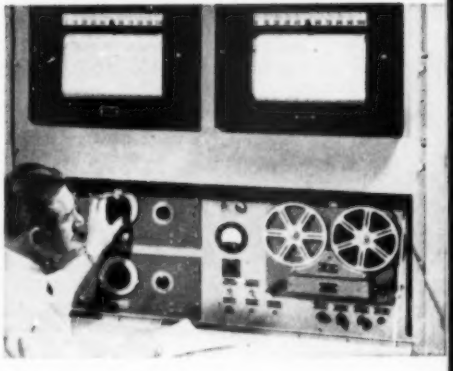
in the new Timken-Detroit indoor proving ground ...and only Timken has it!

We smash, twist, jerk and over-load them. Match every imaginable hauling situation. Then add a few ruinous tricks of our own.

It's done on purpose. So we can tell you in advance that a Timken-Detroit axle can take a more brutal beating on the job it was designed for than any other axle made.

To prove it, we condensed a multi-thousand acre proving ground into one room. In it, our engineers can apply 50 years of experience in building axles for trucks, buses and trailers. Here axles and gearing are subjected *indoors* to any possible *outdoor* hauling condition. Axle performance is measured and analyzed under absolute scientific control!

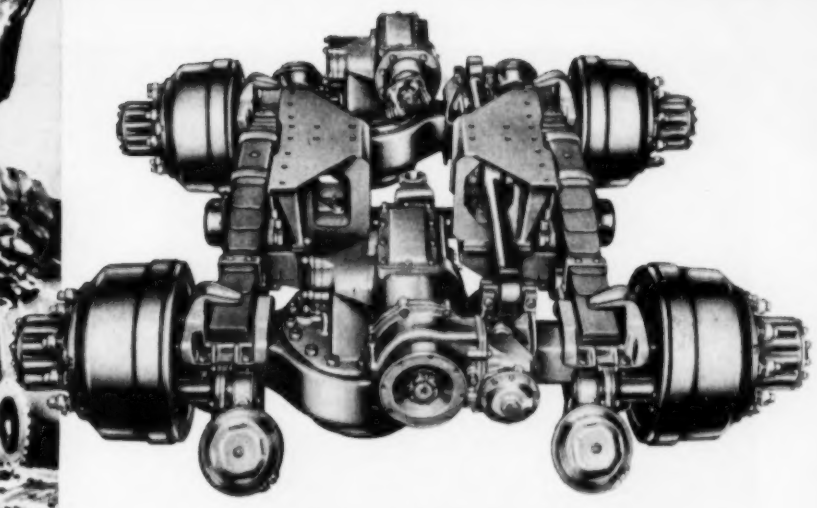
As a result: you enjoy longer axle life; less maintenance, repairs and down-time; lower operating costs; fatter profits. No wonder Timken-Detroit axles are the choice of manufacturers and owners everywhere!



This is our "truck driver," he works in the "Torture Chamber." Above him are graphs showing speed and torque performance under any operating condition he chooses . . . soft ground at full load . . . mountains . . . express highways or side roads. With special dials, recorders and electronic devices, he actually *drives* the axle with scientific accuracy from his chair!

How TDA proves axle quality in this "Torture Chamber."

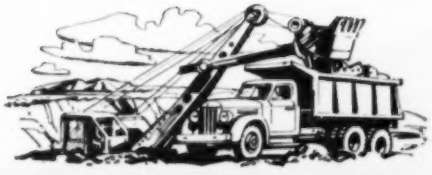
We take one of our axles and put it on the "block". . . . then duplicate the roughest hauling condition, hour after hour, day after day . . . such as simulating 500,000 miles of toughest driving in just a few days. Or we "dream up" a test like going up hill with a full load at 45 m.p.h. from California to New York—*non-stop*. There is no other axle testing like it in the world!



THREE TYPES: Hypoid-helical double-reduction, optional inter-axle differential. Worm drive, without inter-axle differential.

Soft ground? Heavy load—all up-grade? That's a tremendous strain on an axle. But it's nothing compared to what we do in the indoor proving ground! For instance—we take an axle shaft and twist it 14° forward and backward, 36 times a minute, 24 hours a day, week after week. And that's only one test to give you low-cost performance, long axle life regardless of your hauling conditions.

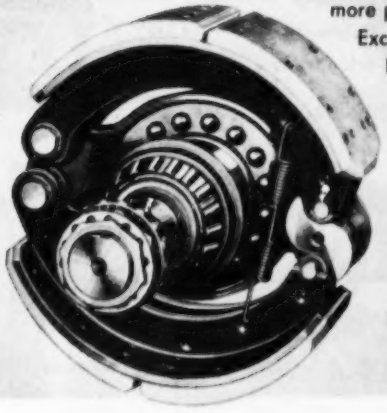
pieces



For six-wheelers . . . the TDA Tandem Drive Rear Axle Unit

Now—the *lightest weight* tandem drive rear axle unit for heavy-duty motor trucks! And with these features, developed, introduced and pioneered by TDA: (1) Available in 3 types of final drives and 3 capacities. (2) Top-mounted straight-line final drive eliminates propeller shaft angularity. (3) Optional inter-axle differential . . . spur gear design, cab-controlled power-lockout. (4) Torsion flow axle shafts . . . guaranteed for 100,000 miles or three years, whichever occurs first. (5) Hot forged steel axle housing . . . guaranteed for the life of the vehicle. (6) Unit-mounted "P" series power brakes . . . for longer life, greater economy and efficiency. (7) Cradle ride spring suspension and paralleled torque rod system . . . maintain correct alignment and weight distribution regardless of driving and braking conditions. (8) Exclusive two-piece trunnion tube bracket speeds servicing. (9) Removable torque rod and spring guide brackets . . . for positive alignment, easier replacement. (10) Rubber torque rod bushings and rubber spring seat bushings . . . eliminate metal-to-metal contact. Require no lubrication.

New TDA brake shoes save up to 40 lbs. per axle



• Lightweight, pressed steel construction to give you more payload plus long wear and safety. Exclusive ¾" TDA "Econoliner" brake liners held rigidly by 12 deep-set rivets per block—*not bolts*. Liners are thickest at center where greatest wear occurs—taper down at ends. Result—longer wear, greater stopping ability. New cam roller mountings never seize or brinnel. Light nylon camshaft bearings wear up to 4 times as long! It's America's new brake shoe!

TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted TDA Standard

TRADE MARK REGISTERED

"TORTURE-TESTED" to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

JEFFREY cast pulleys are better

Jeffrey Cast Iron Pulleys insure the most efficient and economical belt conveyor operation because:

They are more resistant to corrosion, abrasion and rust.

They do not require absolutely stiff shafts.

"Clamp" type hubs really grip shaft, avoid key seat wear.

Heavy *machine-turned* rims are more accurate.

***Machine-turned* faces are truly concentric.**

Variable hub positions on shaft meet all special conditions.

Lagging can be vulcanized or secured with lock nuts which won't back out.

Machined crown faces aid belt training, are accurate and uniform.

Jeffrey Pulleys are cast in one piece from highest quality grey iron. There is a type and size to meet every belt conveyor requirement . . . including single or double arm, solid or clamp hubs, and extra-heavy units for high-tension belts.

Jeffrey Cast Pulleys have given trouble-free and continuous service on outstanding conveyor jobs for more than 30 years. They hardly ever wear out!

JEFFREY BELT CONVEYOR EQUIPMENT INCLUDES:

Belt Idlers — *all types*	Drive Chains
Pulleys	Pillow Blocks
Gears	Sprockets
Shafting	Couplings
Set Collars	Holdbacks
Takeups	Belt Cleaners

WRITE FOR CATALOG NO. 852

THE JEFFREY MANUFACTURING CO.

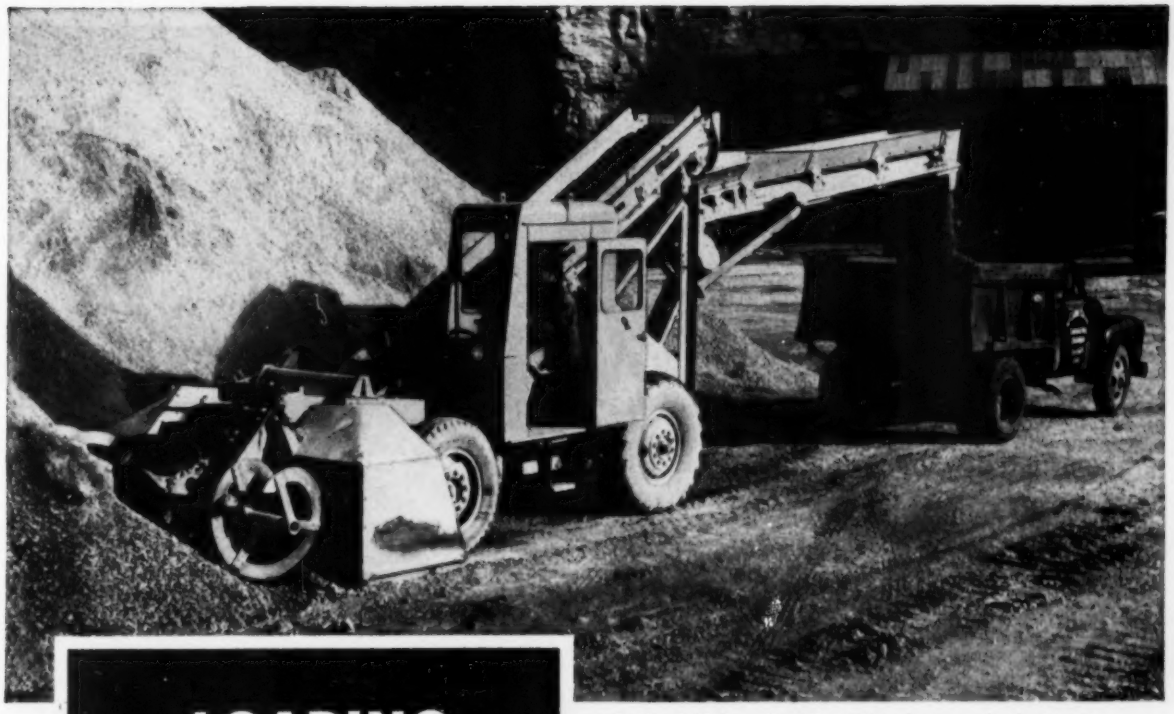
ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED . . . IT'S A JOB FOR JEFFREY!



LOADING UP TO 10 YDS. A MINUTE

That loaded belt on this Athey HiLoader means loads of profit for this quarry operator in Southern Illinois. The HiLoader is equipped with the new Self-cleaning Moldboard that offers a wider width of gather and protects the machine from cave-ins or spill-over when working in high, loose stockpiles.

Athey HiLoader offers steady, high-speed loading!

The rated capacities of most loaders shows only what the machines can do in ideal conditions—but it's the ability of a loader to push out yardage minute after minute, hour after hour that counts. The 10 cu. yds. per minute rating for the Athey HiLoader has been determined after many actual work hours on many applications. Its ability to turn out this top production, hour after hour, is what makes the HiLoader profitable for any material handler.

The HiLoader is built with strength and quality to work with a minimum of maintenance through thousands of tough hours. With proper maintenance, the HiLoader's hourly output is limited only by the operator's ability and available hauling units.

Your Athey-Caterpillar Dealer can show you the many quality features of the better-built HiLoader . . . and he can show you how it will perform on your work. Just call to arrange a demonstration or write to . . .

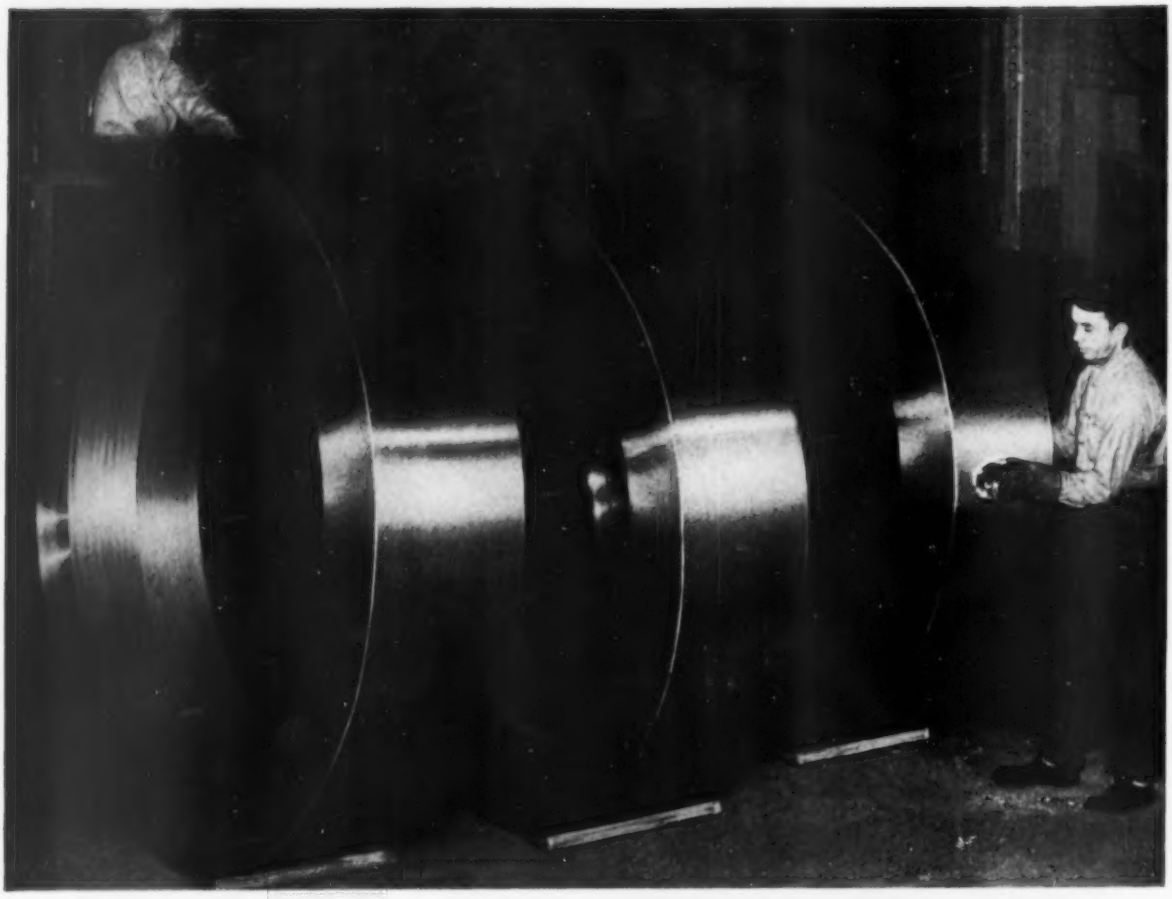
ATHEY PRODUCTS CORPORATION
5631 West 65th Street • Chicago 38, Illinois

Send for the colorful, new booklet on the Athey HiLoader—

IT'S FREE!

Loaded with facts and figures the HiLoader booklet will be sent on request.

Athey
PRODUCTS CORPORATION



MIDVALE ROLL SHELLS *Stand The Grind*

Tougher, higher resistance to abrasion that "goes down deep" to provide longer service . . . cuts your cost per ton crushed – that describes Midvale Roll Shells.

Midvale Roll Shells combine maximum toughness with remarkable freedom from breakage, and plenty of "bite." Their manufacture is controlled from the ingot to the final machining in Midvale's own plants. We make and shape our own steel for roll shells to stand up and take the toughest wear. The performance records of Midvale Roll Shells in leading mines, smelting companies and quarries prove it.

Bring your roll shell and other machinery maintenance problems to Midvale. Let us recommend the best material to save you costly breakdowns . . . to lower your cost per ton crushed.

THE MIDVALE COMPANY-Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, FLANGES, STAINLESS STEEL CASTINGS

30% to 40% faster drilling: D. C. Toye Company's 7500 cu. yd. foundation excavation for Willamette View Manor near Milwaukie, Oregon, included 3500 yds. of basalt rock. Blasts had to be kept small because of nearby hospital. 6′ to 8′ holes were drilled on 4′ to 6′ centers with a 55 lb. sinker. *By using a Jaeger Model 125 compressor, instead of a 105, drilling was completed 30% to 40% faster.*

80 yds. of rock per hour per drill: With 10 wagon drills, H. W. Holt & Son averaged 16,000 cu. yds. of rock excavation per 20-hour day on West Virginia Turnpike. A "600" compressor behind each pair of drills kept them at the required top speed. No excavating contractor, today, would buy a 500 ft. compressor for such work. *The other "old standard" sizes of 60, 105, 160, 210 and 315 ft. are on the way out for similar reasons.*

To power your tools at full efficiency

Jaeger gives you 15% to 25% more air

The difference between a "new standard" Jaeger and others is 15% to 25% more air for your money — 75 ft. instead of 60, 125 ft. instead of 105, and larger sizes comparable.

On the job that additional air often means full pressure instead of mere 70 lbs. pressure at the tools, directly increasing work output 30% to 40%.

Jaeger "Air Plus" compressors have been delivering these higher volumes for years, at moderate temperatures, with notably low fuel consumption, and we believe, the lowest cost of upkeep of any compressors.

Now, when cost-savings are so important, ask your Jaeger distributor to show what he can save you on air and air tool operation — or send for Catalog JC-1.

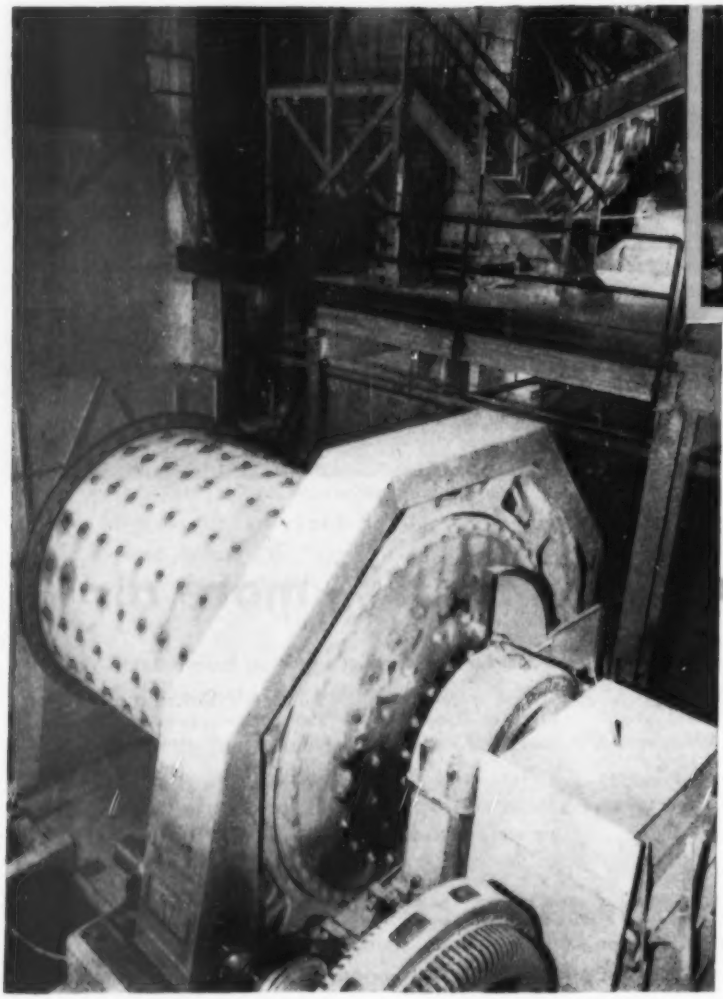
THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • TRACTOR LOADERS • PAVING MACHINES

Here's How INDUSTRY'S TOP TECHNICAL Helps Grinding Mill Operators

HELPS PLANT AND CONSULTING ENGINEERS — Here's the way it works. Let's suppose you are building a new concentrator and you want information and recommendations on crushing, grinding, screening, process flow and equipment needed. Allis-Chalmers specialists, familiar with the process problems involved, work with your engineers to provide a solution.



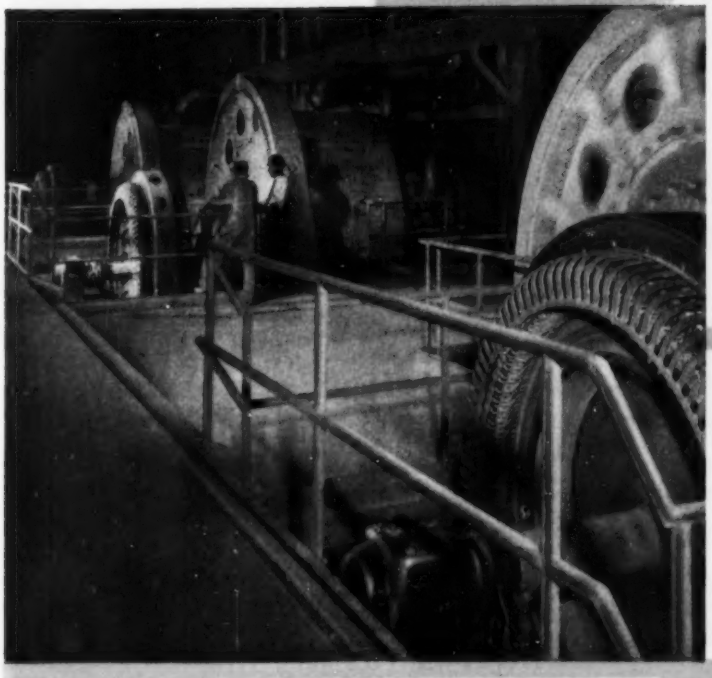
TESTS ORE SAMPLES — Ore samples are sent to the A-C laboratory for crushing, grinding, screening and additional tests to determine the equipment and process best suited to produce the desired end product. This laboratory is one of the best-equipped, best-staffed in the country. View of a section of the pilot grinding mill is shown.

FURNISHES INFORMATION ON PROCESS FLOW AND EQUIPMENT — From lab test information and wide experience gained in solving similar problems, a flow sheet and a list of needed equipment are worked out. In the plant shown here, Allis-Chalmers recommended and furnished the rod and ball mills.

ALLIS-

TEAM

ALLIS-CHALMERS
PROGRESS IN
Grinding Mills



PROVIDES CONTINUOUS SERVICE — When maintenance is necessary, a telephone call will put another A-C team to work on your problem. Complete records are kept on every Allis-Chalmers grinding mill. If parts are needed, these records are checked, and *exact* duplicate parts are speeded to you. Your nearest A-C District Office is always ready to help you. One section of the tremendous inventory of parts stocked at A-C is shown in this photo.

A COMPLETE PLANT OR A SINGLE MACHINE—Because Allis-Chalmers builds many types of equipment . . . crushers, grinding mills, screens, washers, kilns, coolers as well as the electrical power generating equipment, motors and controls, they can furnish a whole plant or a single machine. Allis-Chalmers offers the advantage of undivided responsibility for the complete process and equipment package.

AN ALLIS-CHALMERS TECHNICAL TEAM is always ready to work with your plant or consulting engineers on your grinding or processing problems. To take advantage of their services, call your nearest Allis-Chalmers District Office, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4292

ALLIS-CHALMERS EQUIPMENT FOR THE MINING AND ROCK PRODUCT INDUSTRIES

Crushers, all types — Vibrating screens, all types — Kilns — Coolers — Washers — Dryers — Smelting equipment

CHALMERS

A-C ALLIS-CHALMERS

SINCE 1856
HUMBOLDT
Mines Equipment, Mineral Dressing Plants, Crushing and Grinding Machinery, Cement Factories, Metallurgical Works, Coal Preparation Plants, Steel Constructions for Buildings and Bridges.
SINCE 1864
DEUTZ
Otto-, Gas-, Diesel-Engines for Every Purpose of Two- and Four-Stroke design, Output range 3-1650 H.P. Cooled by water or air, Diesel-powered tractors, Diesel locomotives, Gas producer plants.
SINCE 1864
MAGIRUS
Trucks and busses driven by air-cooled DEUTZ Diesel engines, Vehicles for municipal services, Fire ladders, fire engines, Fire fighting water trucks, Two-wheeled ladders, Fire fighting equipment.
KLÖCKNER-HUMBOLDT-DEUTZ AG · KÖLN

KLOCKNER-HUMBOLDT-DEUTZ A.G. **KÖLN-DEUTZ, GERMANY**

TELSMITH Gyraspheres

Style S FOR COARSE CRUSHING

take a choke feed

● Sock in the rock. Big chunks or slabs. Feed openings are big—no obstructions. Vigorous crushing action!

It's **Style S**—heavier in design—with all of the Telsmith time-tried-and-tested *Gyrasphere* advantages.

Long, High Speed Crushing Stroke for maximum capacity.

Spherical Head for more uniform, cubical product.

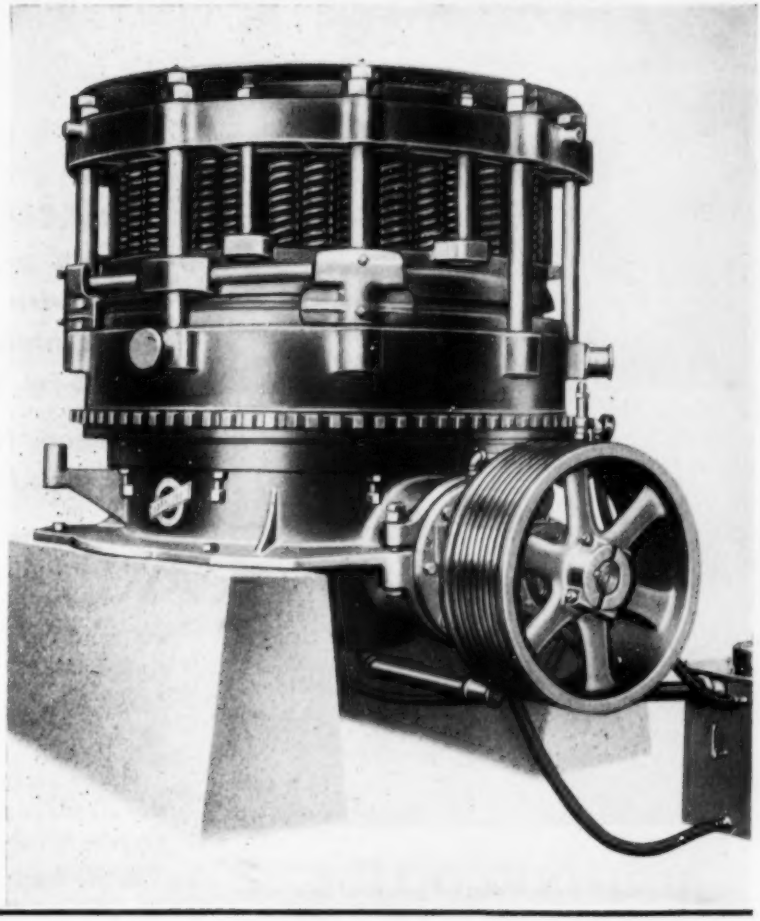
Cam-and-Lever Crushing Action with Roller Bearings for low horsepower requirements.

Spring Relief for protection against tramp iron and packing.

Easy Accessibility assures lowest maintenance costs.

Style S Coarse Crusher—24″ to 48″ sizes: 3¼″ to 9″ feed openings; 10 to 320 tons per hour.

Send for Bulletin No. 274



Y-15

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17, N. Y. · 211 W. Wacker Drive Chicago 6, Ill. · 713 Commercial Trust Bldg. Philadelphia 2, Pa. · 238 Main Street Cambridge 42, Mass. · Boehck Eqpt. Co. Milwaukee 3, Wis. · The McLean Co., 3525 Lakeside Ave. Cleveland 14, Ohio

Marens Eqpt. Co., New Hudson, Mich. • Rish Eqpt. Co., Cincinnati 14, & Portsmouth, Ohio—Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. Robert S. Bailey, 816 W. 5th St., Los Angeles 17, Calif. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash.

drill holes faster

– get greater footage, better fragmentation, lower costs

Use a

Le Roi-CLEVELAND

T286 Self Propelled Dual Drill Rig

It's 2 Le Roi-CLEVELAND patented air feeds and drills with air-motor booms mounted on a 25-hp tractor

3 speeds forward... 1 speed reverse

One Le Roi Airmaster 600 cfm Compressor provides all the low-cost air you need to operate the T286 Dual Drill Rig, when it is equipped with Le Roi-CLEVELAND 4" drifters. A smaller compressor is sufficient, when the T286 is equipped with the 45-lb. H10 or 80-lb. H23 (3¼"-bore) sinker drills or 3½"-bore D25 drifter.

WITH a Le Roi-CLEVELAND T286, your man *drives* where he wants to go — over almost any kind of ground — and tows the compressor right along.

He drills and cleans holes as deep as 30' — in any direction — at any angle — with less air.

Have your nearby Le Roi distributor show you how this all adds up to faster drilling, better hole spacing, greater footage, better fragmentation, lower costs.

Write for Bulletin RD-21.

C-143

LE ROI COMPANY

CLEVELAND ROCK DRILL DIVISION
12500 Berea Road • Cleveland 11, Ohio
Plants: Milwaukee, Cleveland and Greenwich, Ohio

SMALL QUARRIES AND MINES IMPROVE THEIR PROFIT PICTURE WITH "EUCS"

fewer drivers . . . lower fuel cost . . . reduced maintenance

When your competitors are using "Eucs" to haul stone, sand or gravel, you've really got a problem on your hands! You just can't afford to pass up the cost cutting advantages . . . the high production and low maintenance cost . . . that you get with "Eucs".

And your operation doesn't have to be a big tonnage producer for "Eucs" to pay off. For example, H & R Stone Co. of Indiana is just one of many small quarries, sand and gravel producers, and open pit mines that have cut their hauling costs with Model UD 10-ton Rear Dumps. This quarry replaced four conventional highway trucks with a single 10-ton "Euc" and reports savings of $6000 per year in maintenance cost alone. Because the "Euc" stays on the job with none of the lost time that was a costly headache previously, there have been important savings in labor cost, too.

Have your nearby Euclid Distributor provide a production and cost estimate for your operation . . . there's no obligation and the chances are mighty good that he can show the way to better profits through lower hauling costs.

10-ton off-highway "Euc"

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

He Knows!

EXPERIENCE is the truest guide to production efficiency and economy... and experience in the quarries proves that Roebling wire rope is your one top choice for avoiding delays, cutting down replacements and saving wire rope dollars.

All over the country, large numbers of experienced wire rope users definitely prefer Roebling wire rope. Call your nearest Roebling office or distributor for a Roebling recommendation.

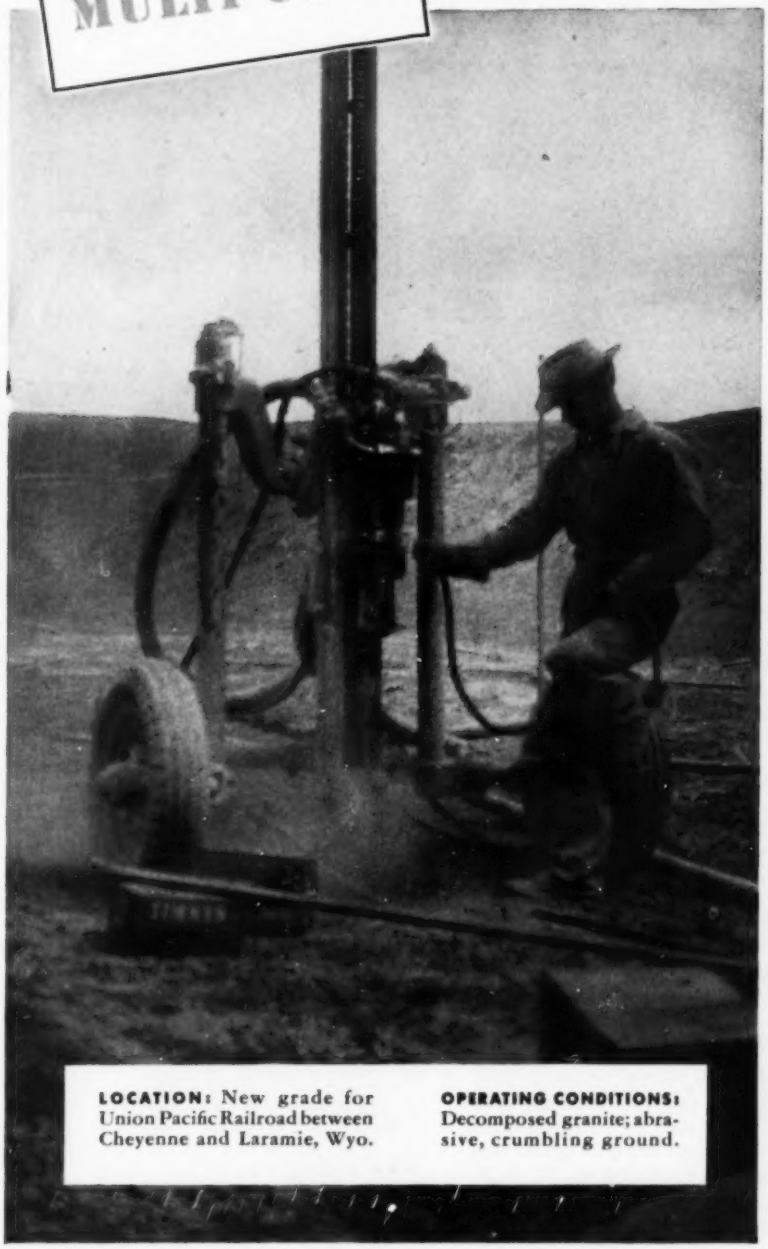
ROEBLING CFI

A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

CARBIDE INSERT? or MULTI-USE?

Morrison-Knudsen made faster drilling time on this big railroad job with TIMKEN® carbide insert bits



LOCATION: New grade for Union Pacific Railroad between Cheyenne and Laramie, Wyo.

OPERATING CONDITIONS: Decomposed granite; abrasive, crumbling ground.

Morrison-Knudsen Company had a big project on the Union Pacific Railroad. They lowered the grade over Sherman Hill and completed about 38 miles of new grade in 12 months.

They tried various bits on this job and found that Timken® carbide insert bits gave them lowest cost per foot of hole drilled. They drilled decomposed granite—crumbling and abrasive. With Timken carbide insert bits they drilled faster and had fewer bit changes.

In hard and abrasive ground, you can always drill faster with Timken carbide insert bits. They're also most economical for constant-gage holes, small-diameter blast holes, or extremely deep holes.

But they're not *always* the most economical bit . . .

In ordinary ground, Timken multi-use bits are usually best. With correct and controlled reconditioning, they give lowest cost per foot of hole when you can drill full increments of steel.

All Timken bits, carbide insert and multi-use, are interchangeable in the same thread series. You can switch bits quickly and easily, right on the job.

To get the bits best suited to your drilling requirements, call on the Timken Rock Bit Engineering Service. Write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

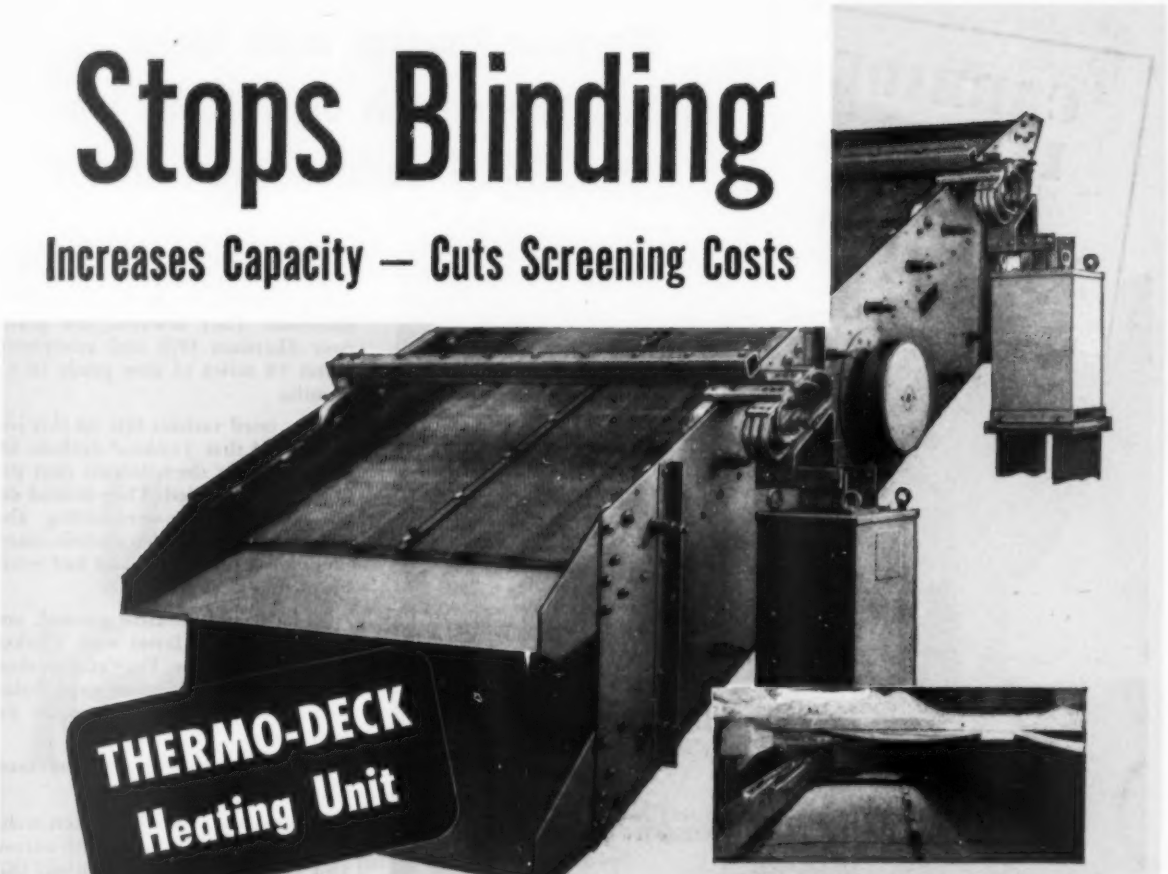
...your best bet for the best bit ...for every job

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

Stops Blinding

Increases Capacity — Cuts Screening Costs



You can screen fine, moist material *continuously* with a *Thermo-Deck* heating unit. No down time required to clear fine or medium mesh screen cloth!

Heated screen cloth remains open . . . you get *more* tonnage through the screen and better separation.

Operating records prove that heated wire cloth screens last up to three times longer than non-heated cloth, because they do not have to be pounded free of blinded material. For the same reason, you save man-hours too. These lower costs increase your profits.

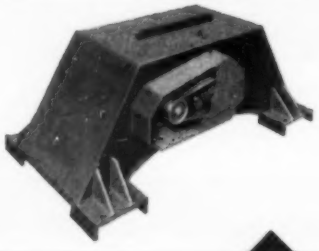
The *Thermo-Deck* unit can be applied to Allis-Chalmers screens in the field. See your nearby Allis-Chalmers representative for complete details. Or write Allis-Chalmers, Milwaukee 1, Wis., for Bulletin 07B7812.

POWER ON, *Thermo-Deck* heating unit keeps screen cloth clear on vibrating screen handling fine, moist material.

POWER OFF, troublesome blinding occurs. This view shows same screen as above, with *Thermo-Deck* unit shut off.

No Unloading Troubles—with Car Shaker

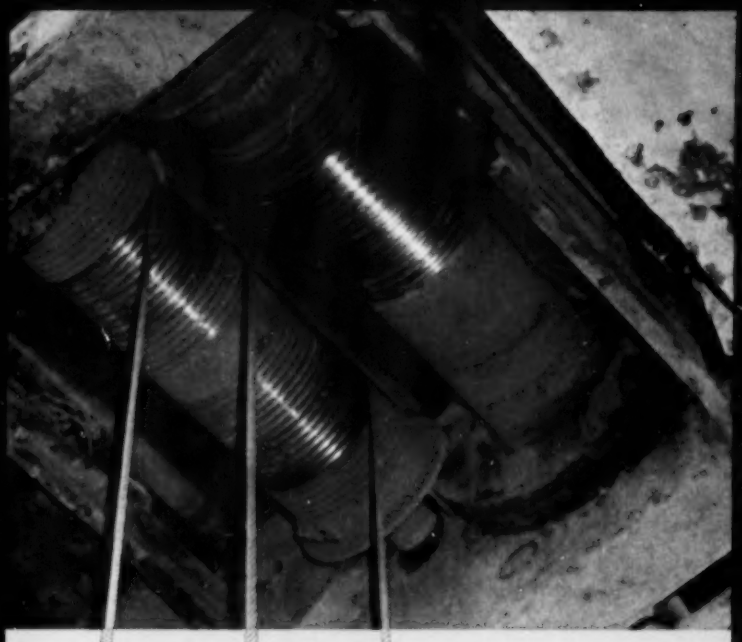
An Allis-Chalmers car shaker will unload hopper bottom cars in minutes . . . even if your material is compacted, damp or partially frozen. Takes only ½ to ¾ minutes to unload ½ to 6 inch rock. 1½ to 2¼ minutes to unload wet sand. 1 to 6 minutes for ROM to 10 mesh x 0 coal screenings. Push button operation. Fits all gondola cars. Send for Bulletin 07B7221A. A-4273



ALLIS-CHALMERS

AC ALLIS-CHALMERS

Thermo-Deck and Sta-Kleen are Allis-Chalmers trademarks



TSP

the drum nobody beats

Calaveras Cement Co. reports:

- **4 tough years and still in service**
- **no wear to date**
- **3 times life of drums formerly used**

That's the "Tool Steel Process" record at Calaveras Cement Co., San Andreas, Calif., where TSP products are widely used, and that's why in cement plants all over the nation a TSP drum is a drum nobody can beat.

here's why: Ordinary drums have soft groove surfaces. They develop wear, corrugating, and chafing, resulting in frequent costly cable and drum replacements. TSP drums are file hard with smooth, true wear-resistant grooves. They stay that way for years. Any side swinging of loads has no effect on TSP drum grooves. All chafing of cables is eliminated. Savings in cables alone will pay for the drums, because, to date, no TSP drum has ever worn out.

Write today for your copy of Bulletin 452, illustrating the many TSP products available for the cement industry... each carrying an absolutely positive written GUARANTEE to give a longer life in the same service than any other product.

Calaveras Cement has achieved tremendous savings using such TSP products as Sheave Wheels, Track Wheels, Trunnion Rollers, Gears, Pinions, Sprockets, as well as Crane Drums.

THE TOOL STEEL GEAR AND PINION CO.
CINCINNATI 16, OHIO, U. S. A.

AD 52-69

for Gears • Pinions • Rolls • Wheels and Other Hardened Products

Scores of GRINDING PROBLEMS

PULVERIZING AND SEPARATING

BLENDING INTIMATE MIXTURES

DISINTEGRATING AERATING AND CLASSIFYING

DRYING AND GRINDING

COOLING AND CONVEYING

REJECTING IMPURITIES

ECONOMICALLY HANDLED *by the Raymond* WHIZZER EQUIPPED IMP MILL

THIS is a compact, self-contained grinding unit for continuous processing of materials from feed hopper to finish bin. The whizzer separator gives close product control. Changes in fineness are made by one simple adjustment while the mill is running.

The wide adaptability of the Raymond *whizzer-type* Imp Mill makes it a highly efficient and dust-free unit for producing the many different types and grades of powdered materials in the non-metallics field.

The Imp Mill delivers a uniform finished product to meet exacting specifications and gives superior results on many unusual operations such as disintegrating and drying various clays, blending pigments, and handling materials which require a cool operating mill.

If you have a special production problem, let Raymond engineers advise you on the most economical type of unit for your purpose.

Many applications described in CATALOG NO. 67

Write for your copy

COMBUSTION ENGINEERING, INC.

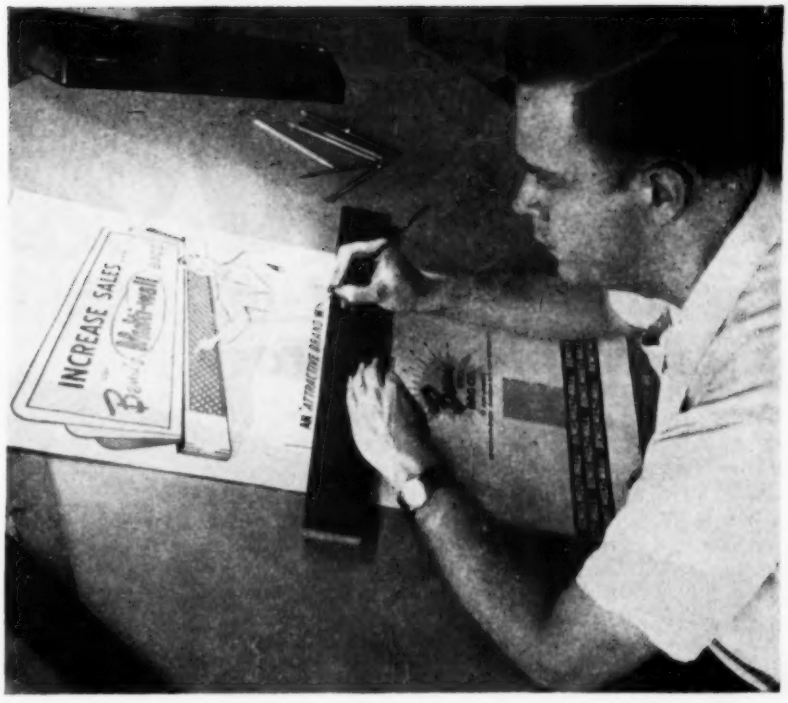
Raymond Division

1321 NORTH BRANCH ST., CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

No. 2 of a series

How Bemis makes GOOD multiwall bags for you

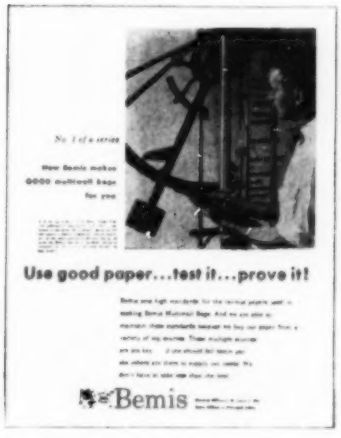


Brands that SELL are designed by Bemis artists like Jack Mahnken, of the Art Department at the St. Louis plant. Before joining Bemis, Jack majored in the nationally known School of Art of Washington University, took advanced courses in commercial design at Hadley Tech, and worked in advertising display studios.

Our artists help make your brand *sell!*

Your brand on your multiwall bag is a salesman. It can help to make . . . or lose . . . a sale. Bemis art departments create customer brands that *help sell the product* . . . and give established brands a touch that jumps their selling power.

Also, Bemis is the only bag maker whose artists can offer you the benefits of QUANTACOLOR, the scientific method of making certain that the colors combined in any design are truly in harmony. QUANTACOLOR has proved that it helps to sell merchandise.



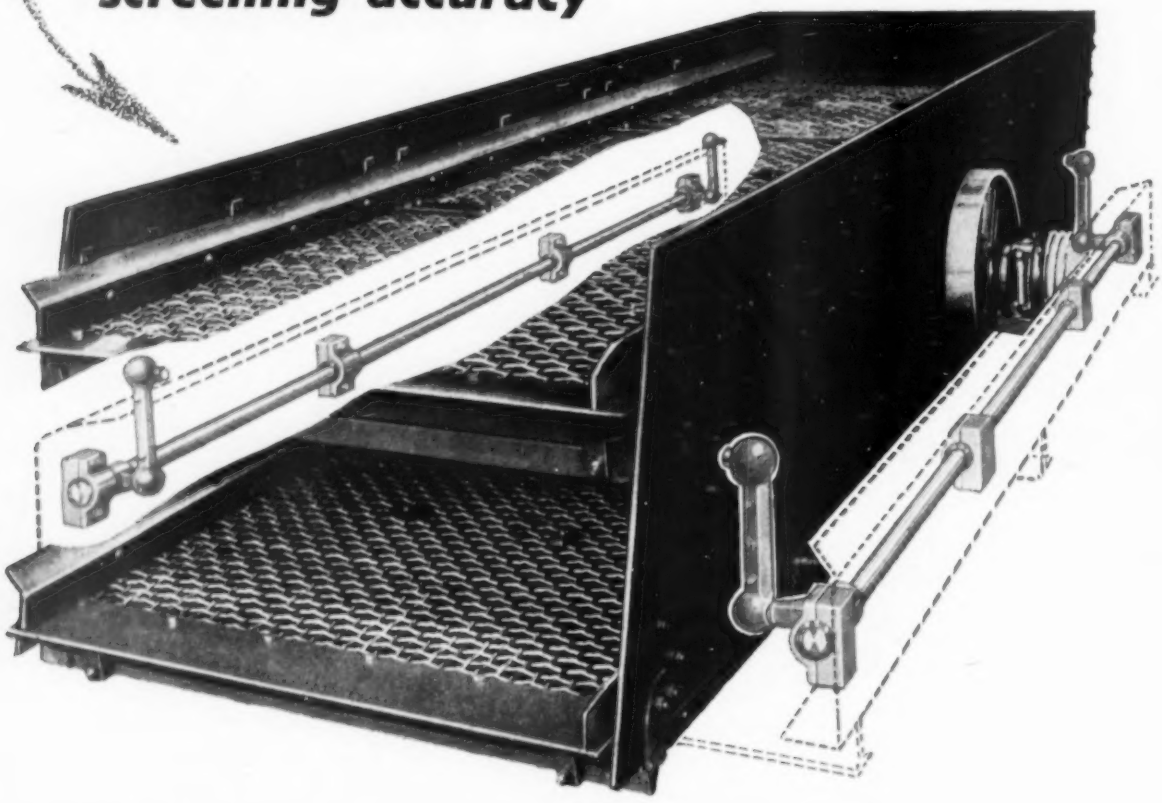
BEMIS BRO BAG COMPANY

Bemis

General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

Get SECO Screens

and get built-in screening accuracy



Only SECO Vibrating Screens have the Patented Equalizer Assembly

Take a good look at the cutaway illustration above. Outlined in red is SECO's patented equalizer assembly, the key to fully-controlled true circular action.

What does this mean to you? Well, specifically, it means a very sure, sharp whip that quickly stratifies the material and drives the minus product thoroughly through the meshes. Obvious result—capacity and accuracy of sizing. Isn't that what you're looking for?

Want further proof of SECO performance superiority? Thousands of operators in all sections of the country attest to SECO superiority on all types of screening assignments.

Many SECO screens are still actively on the job after fifteen years of efficient production. Send for literature.

SECO

TRUE CIRCULAR ACTION

VIBRATING SCREENS

Get maximum screening accuracy on your job. SECO invites your inquiry. We make vibrating screens exclusively; thus you can be assured of prompt, interested attention to your toughest screening problems. Write, wire or phone.

SCREEN EQUIPMENT CO., Inc.

Buffalo 25, N.Y.

YOURS...the best deal in the entire truck field...

DODGE

Yes . . . compare the facts and figures shown at right and you'll come to this one clear conclusion . . . *Dodge trucks give you a better deal than any other leading make!* So, before you invest a single dime in a new truck, check the deal you get with Dodge! Visit your friendly Dodge dealer this week. He's ready to serve you—anytime you say.

Look at these Dodge advantages! See how Dodge gives you a better deal in every way!

Sharpest turning with new steering system, 39° turning angle! B-108 pick-up U-turns in less space than most cars!

Widest, roomiest cab of them all, with 61¾" of hiproom, 58⅝" of shoulder-room! Real 3-man size!

Best visibility with 951 sq. in. one-piece curved windshield—biggest of any truck! See *better*, see *more* with Dodge!

Deepest, most comfortable seat with 86 soft, cushioning coil springs! Chair-high (16") for easier driving!

Lowest lines with lower center of gravity for better stability, lower body floors in pick-ups and panels for easier loading!

Biggest line of sixes and eights. From 100 to 172 hp.! Assures the right power and economy for *your* job!

Most powerful high-tonnage V-8's *anywhere* . . . 153 hp. in 2¾-ton, 172 hp. in 3-, 3½-ton!

Shortest conventional tractors of any make 1½- through 3½-ton—102" from bumper to back of cab! Haul longer trailers, carry larger loads!

Lowest priced no-shift driving on low-tonnage trucks! Truck-o-matic transmission with gyrol Fluid Drive!

Easiest entry and exit—lowest cab floor, widest door opening saves time and effort when you're stepping in and out!

Biggest ½-ton load capacity—Dodge high-side pick-ups. *Up to 44% more* load space than other makes! Biggest ½-ton panels, too!

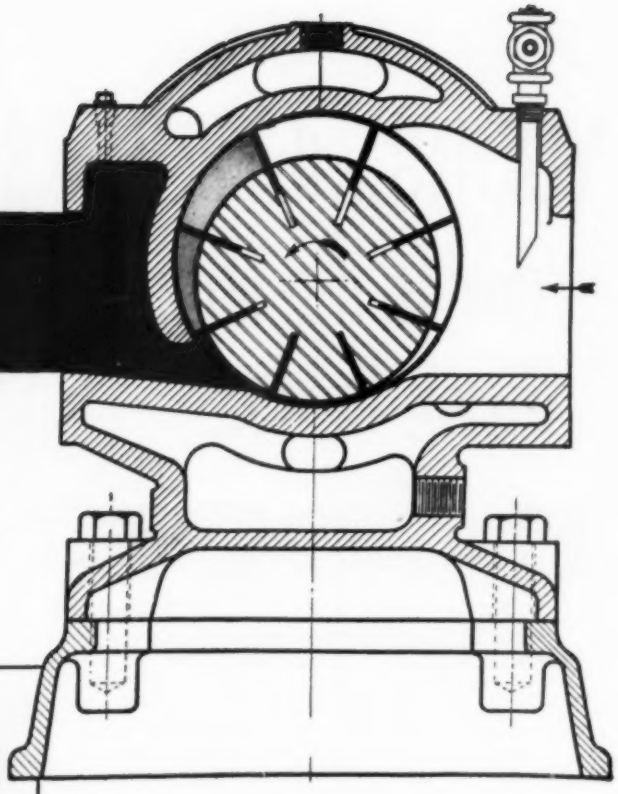
Most efficient controls—all hand controls and dispatch box are in center of instrument panel within easy reach!

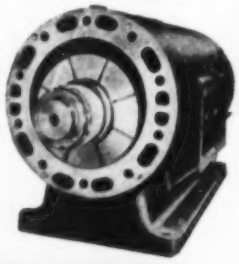
See your friendly Dodge dealer now!

It all adds up to a better deal for the man at the wheel . . . with new

DODGE "Job-Rated" TRUCKS

putting the [redacted] on compression costs





Check your needs for • • • • *Engine Starting Air* • *Pneumatic Power*
Pneumatic Controls
Refrigerant Compression • *General Plant Air*
Instrument Air • *Air Lifts*

When you consider all the many uses you have for compressors—consider the best way to get compression with dependability, and minimum cost and attention.

Fuller Rotary Compressors have so many inherent advantages that they warrant your closest examination. Free from reciprocating parts, with no valves to leak or seats to grind, no unbalanced forces to set up vibration. Fuller Rotary Compressors assure low-cost, smooth-flow operation during their long life.

Check your own compressed-air needs and send this check list to Fuller. A Fuller engineer will give you the *right* recommendation to save you money. Write now to Fuller Company, Catasauqua, Penna.

Fuller **Pioneers of high-efficiency vane-type rotary compressors**

FULLER COMPANY
Catasauqua, Pa.

Branch Offices: Chicago • San Francisco • Los Angeles • Seattle • Birmingham

C-235
2078

GARDNER-DENVER

POWER SWING JUMBOS and REMOTE CONTROLLED DRILLS

for mounting on your own equipment...

All positioning and drilling operations hydraulically operated and remotely controlled from driller's station. All positioning hydraulically locked. Write for information.

SINCE 1859

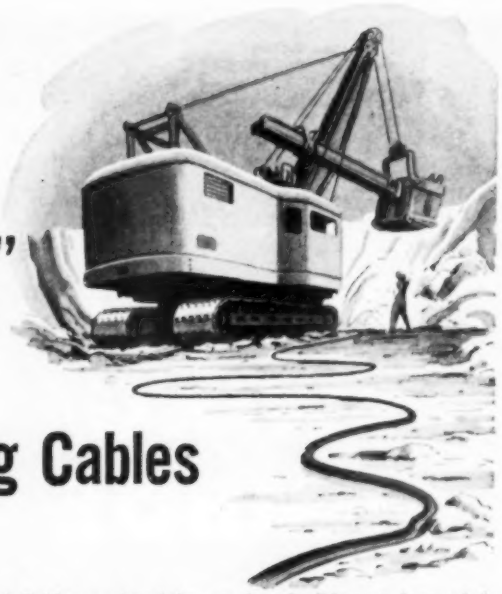
GARDNER-DENVER

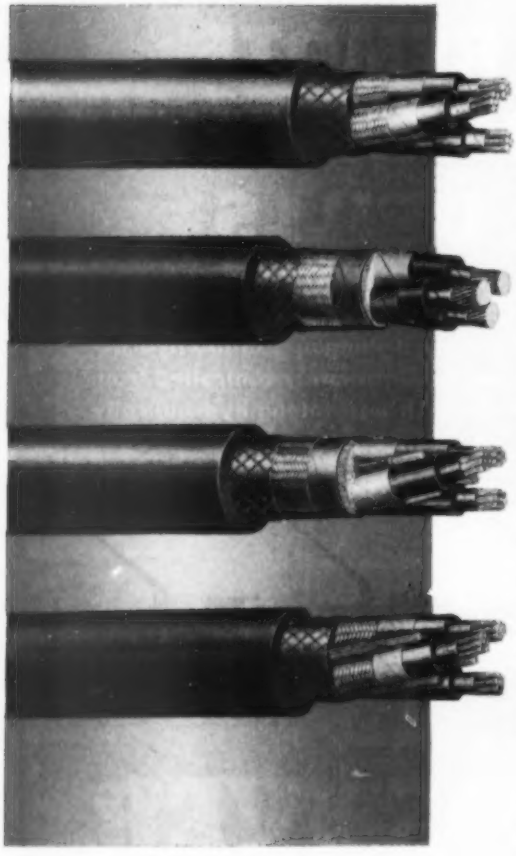
THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

Avoid costly "Downtime" with U. S. Royal Shielded Trailing Cables





U. S. Royal SH-A Cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S Uskorona-1 oil base compound, and covered with colored tapes and a braided coated copper shield. The conductors are then cabled and covered with a reinforced jacket of 60% black neoprene. The shielded braid over each insulated conductor eliminates corona cutting by static discharge through equalization of surface stresses.

SH-B cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound plus colored tapes. Conductors are then cabled with jute fillers, covered with a rubber-filled tape, a braided coated copper shield and reinforced 60% black neoprene jacket. The shielding braid protects the men handling the cable in the event of fault currents.

SH-C cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound and covered with a colored tape. The conductors are cabled with jute fillers and with the specified fabric-covered ground wires in the conductor interstices; then covered with a rubber-filled tape, braided coated copper shield and a reinforced 60% black neoprene jacket. This allows grounding of equipment and provides an adequate low-resistance path for short circuits, thus insuring circuit breaker operation. The grounded equipment provides protection to workmen under fault conditions.

SH-D cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound and covered with a colored tape and a braided coated copper shield. The conductors, together with fabric-covered grounding conductors, are cabled and covered with a reinforced black 60% neoprene jacket. The conductor shielding, when properly grounded, equalizes surface stresses and draws off all capacity charging currents, insuring safety in handling. An adequate low-resistance ground for the equipment is provided by the grounding conductors.

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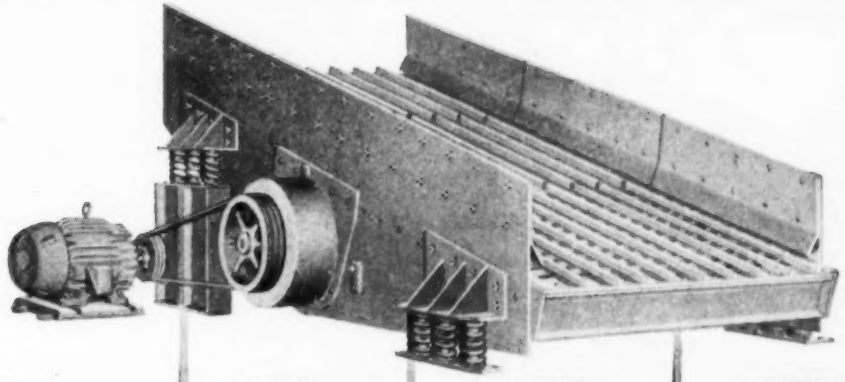

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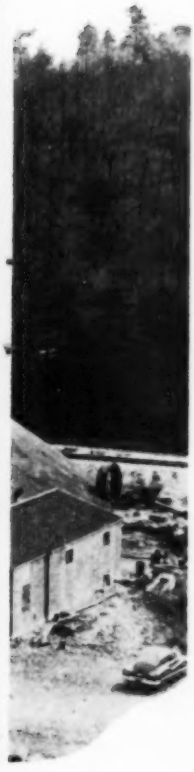

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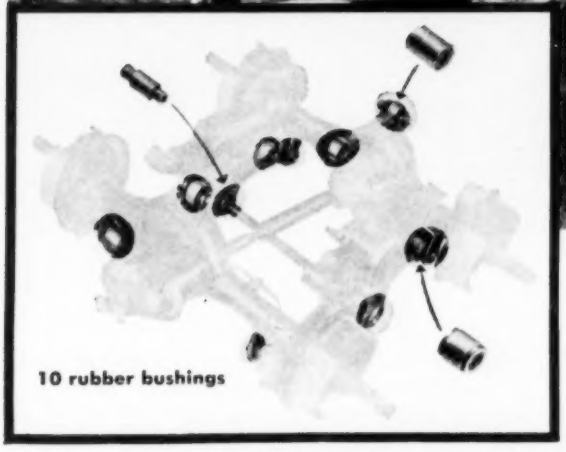

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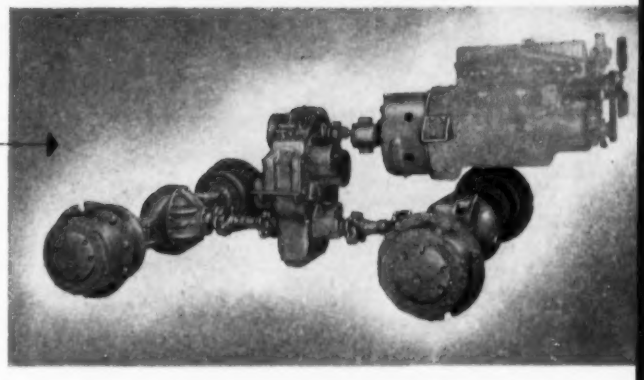

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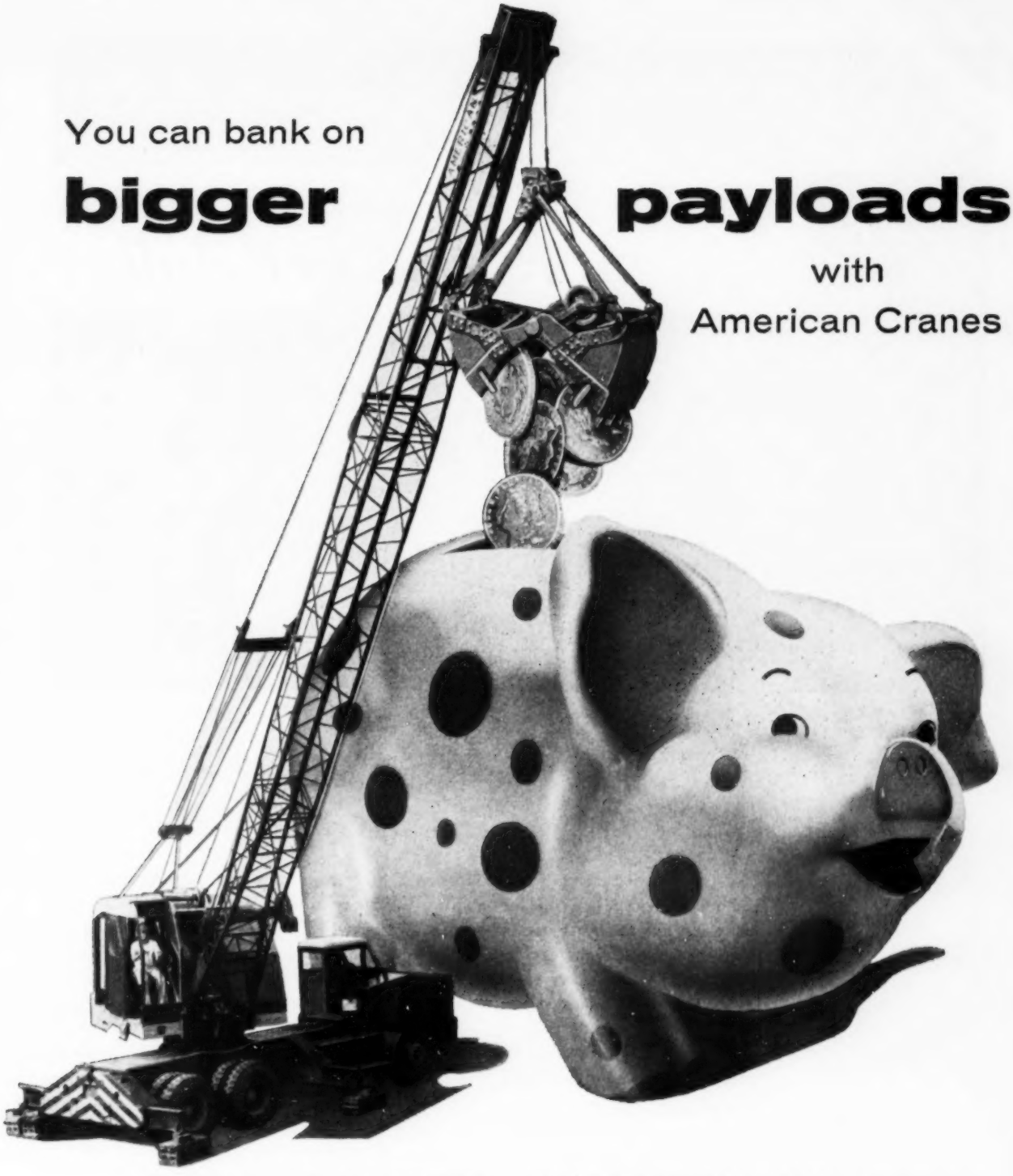

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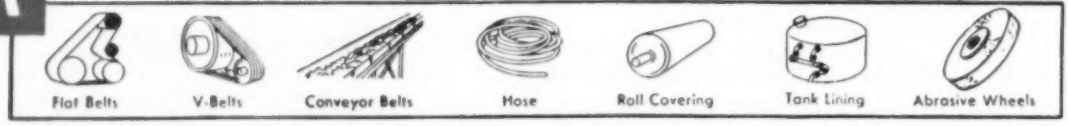

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VOL. 46 JUNE 1954 No. 12

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For **THE CONCRETE MANUFACTURER** Table of Contents, see cover facing page 166.

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in Rotary Kiln-Firing Service

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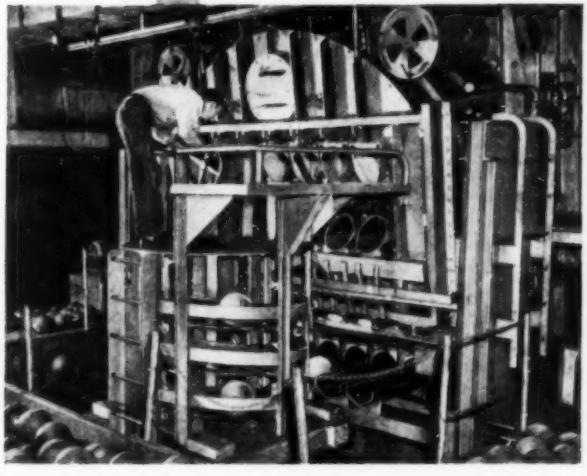
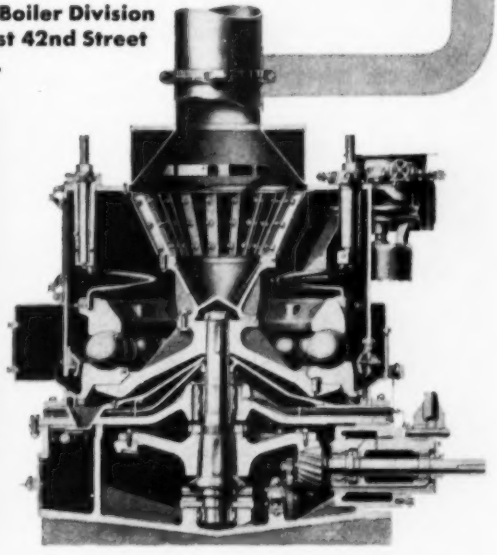




BABCOCK & WILCOX

C-207

editorial

The Guaranteed Annual Wage

THE subject of a "guaranteed annual wage" for union workers is one to which industry and management should be giving long and careful study. For many years union leaders have been proposing this with increasing emphasis, indicating that the demand would be made as soon as they deemed circumstances to be propitious. That time apparently has now arrived, and the guaranteed annual wage is one of the demands being made by unions in current contract renewal negotiations. Early in April the IUE-CIO included this in its proposals to Westinghouse, and it was one of the 11 demands made on the General Electric Company later in that month. Similar demands are now being made on the steel industry, and the rubber and meat-packing industries will be next in line when their contracts expire this year.

The urge for security in the form of steady work and pay is undoubtedly closely related to our natural instinct for self preservation. Industry management recognizes this and also has another very real and compelling urge to attain steady production and steady jobs. As General Electric states in its *Employee Relations News Letter*, "It is the way to have the least capital tied up in facilities, the lowest material costs and the best vendor relations, the least hiring and retraining expenses, the least overtime and call-in expense, the lowest overhead and the highest morale, and to make the steadiest and most rewarding technological progress.

"It is the way to save also on unemployment compensation taxes, since almost all states reduce a given employer's tax in direct relation to his record of avoiding layoffs. This naturally gives him a cost and price advantage—and further steady job advantages—over any competitor with less regular work."

BECAUSE steady production and steady jobs are so overwhelmingly important from both the human and material standpoints, it is good business management to make every possible effort to achieve them. Unfortunately, however, our highly specialized, highly mechanized and competitive economy makes this much more difficult than would be the case in slave states or other planned economies where the steady work provided yields only a bare subsistence, or in primitive economies where each man is fully occupied with the needs of his own immediate family. In spite of this uncertainty we have attained the highest level of living in history, and even our unemployed workers live better here than do the fully employed workers of slave or planned economies.

There have been two general approaches to the problem of guaranteeing work or of providing pay even when there is no work—through private plans or universal plans. The first efforts were through the voluntary private plans of individual companies, most of them in businesses where a high degree of stability of demand or production is comparatively easy to achieve. Three of these plans which have survived have been widely publicized. Not one of these three plans offers a truly guaranteed annual wage or is geared to take care of any abnormal degree of unemployment. Few of the other 190-odd plans now in existence even approach the features of these plans.

The General Electric Company has also tried various types of plans in different plants but has not been able to make them work because of the impossibility of predicting the demand for its various products. As a result of these experiences, according to government studies, less than one-tenth of one percent of the work force in this country is covered by any kind of a private guarantee.

WHILE all this private effort was going on, real unemployment guarantees have become broadly available to workers through their employers under state unemployment insurance systems. Since 1936 almost all business and industrial employees—exclusive of farm workers—have enjoyed guaranteed income out of payments collected by the state through the employer. These payments vary somewhat from state to state and go up to $33 per week for up to 26 weeks, and are tax free to the recipient.

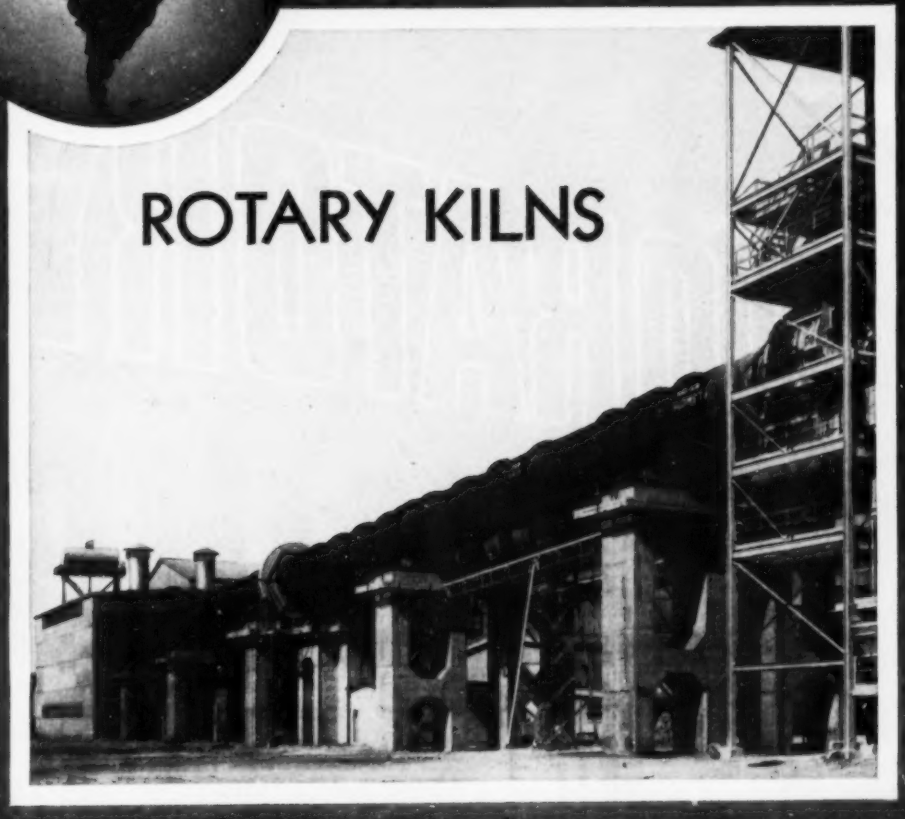
We believe that the state unemployment compensation systems form a guaranteed income plan on practically a universal basis. This plan has never had the test of a serious depression but it has worked reasonably well for 18 years. It has been constantly improved and is under examination for further possible improvement at almost every session of every state legislature. It would be far better to adjust this plan to meet changing conditions than to wreck it in favor of the privately-negotiated and discriminatory plans suggested by the unions.

ANY feeling that private plans to guarantee annual wages provide actual security is an illusion, as no one can foretell business developments and how they will affect a business or industry. Actually, the rigid liability of a guaranteed wage agreement would threaten the solvency of a business any time the volume of demand falls off. We have had a seller's market—for labor as well as for goods and services—and have been able to absorb higher costs and prices. This is no longer the case, and this would be the worst possible time to impose on production the higher costs which any private wage guarantee plan would inevitably create.

Employers can help themselves and their workers by resisting any such union demands. It is historic that if one segment of an industry gives in to a union demand, the others inevitably are forced to follow; and if one industry gives in, a similar pressure is exerted on all others. In the meantime, industries, their trade associations, and related groups should give even more thought to every possible way of spreading production, and consequently employment, throughout the entire year. This is especially difficult in most of the nonmetallic minerals industries because of the seasonal nature of their demand; but much progress has been made, and there is room for further improvement.

Walter E. Trauffer

SMIDTH



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news of the industry

PIT AND QUARRY

Natl. Gypsum Gets Rights For Indiana Operations—Considers Canadian Plants

Mining rights for 750 acres of Martin County State Forest land in Indiana were awarded to the National Gypsum Company on April 6 by the Indiana Conservation Commission, which accepted the company's bid of $31,800.

Under the terms of the transaction, National Gypsum is to have a mine and a processing plant in operation within two and one-half years unless prevented by circumstances beyond its control. These facilities, it was indicated, will be located near Shoals, about 60 miles south of Indianapolis. It is estimated that the annual volume of business at the proposed Shoals plant will be between $5,000,000 and $7,000,000.

Company engineers and geologists last year discovered substantial gypsum deposits in the Shoals area; and further investigations and negotiations culminated in the transaction with the state commission. In all, the concern has acquired mining rights for approximately 2,000 acres in the area.

According to National Gypsum officials, the firm is also contemplating other processing plants in Montreal and Toronto. Facilities at Montreal would be installed to promote new markets for the extensive gypsum deposits located last year near Halifax, N. S. Those near Toronto would be undertaken upon the completion of the St. Lawrence seaway.

Permanente's Kaiser Reports On New and Expanded Plants

Henry J. Kaiser, president of the Permanente Cement Company, stated in his annual report that the construction of the firm's $4,000,000 gypsum products plant in Seattle is expected to be opened and in operation by September.

Glacier Sand & Gravel Company's newly-enlarged sand, gravel, and crushed stone plant at Steilacoom, Wash., has also been completed, at a cost of $850,000. These facilities now will have a capacity of 1,000,000 tons annually. Glacier is a wholly-owned subsidiary of Permanente.

Black Lake Asbestos Mining Approved by Quebec Govt.

Under the terms of the Quebec provincial government's authorization of a $30,000,000 asbestos mining project, United Asbestos Corporation, Ltd., and Lake Asbestos, Ltd.—subsidiaries of American Smelting & Refining, Ltd.—soon will drain Black Lake to recover an estimated 50,000,000 tons of asbestos fiber.

Opening of operations will begin after more than a year of engineering and negotiations with the provincial government. Location of the project is about 80 miles southwest of Quebec City.

Coming Events

June 13-18, 1954 — Chicago. 57th annual meeting and exhibit, American Society for Testing Materials. Sherman and Morrison Hotels.

July 22-23, 1954—Hot Springs, Va. Directors' meeting, National Crushed Stone Association. The Homestead.

August 25-26, 1954 — Murray Bay, Quebec. Directors' meeting, National Sand and Gravel Association. Manoir Richelieu.

October 18-22, 1954 — Chicago. 42nd National Safety Congress and Exposition. Conrad Hilton Hotel.

Quarry, Plant Developed By Northwestern Portland To Be Ready This Summer

At Soda Springs, Wash., 10 miles above the head of Lake Wenatchee, the Northwestern Portland Cement Company is currently preparing a $350,000 limestone quarry operation to supply raw material for its plant at Grotto. It is expected that the plant, consisting of two crushers, a conveyor system, and a truck-loading bunker, will be in operation in the near future. The rock will be trucked to Winton, then shipped by rail to Grotto.

According to Gordon Tongue, president of the company, tests conducted at the quarry site showed reserves which will be sufficient for operations covering the next 50 years. The new plant will produce 750 tons of crushed stone per day, or 500,000 tons per year. Northwestern has already spent $100,000 to improve the first 10 miles of the twisting forest service road to the site. Yearly capacity at Grotto is 600,000 bbl.

Plant Expansion to Up Output Of Arizona Portland Cement

Officials of the Arizona Portland Cement Company have revealed that the firm will soon expand its facilities at Rillito, Ariz., to produce an annual capacity of 2,500,000 bbl., more than was used in the entire state in 1953. Addition of a new kiln will be the second such enlargement project since the plant began producing cement in 1949. This kiln will be larger than the two existing units.

Present capacity exceeds 4,000 bbl. or 16,000 sacks per day; the proposed expansion will boost these figures to 7,000 bbl. or 28,000 sacks per day.

It was indicated that the project will cost several million dollars. No date has been set for the start of work on the installation of the new kiln and accessories. Arizona Portland Cement is a subsidiary of the California Portland Cement Company.

April Contract Awards Show Rise Over March—Set 4-Month Record

Contract awards for future construction in the 37 eastern states, as reported by F. W. Dodge Corporation remained at "extremely high" levels in April.

The total was $1,691,868,000, about 11 percent above that of March. The figure was only some $50,000,000 behind the all-time April record, set in 1953, which included almost $150,000,000 for Atomic Energy Commission projects. No such unusual items appeared in the April, 1954, total. In spite of the extraordinary size of the April, 1953, total, April of this year lagged only 3 percent behind.

The Dodge total for the January-April period set a new high for the first four months in any year of Dodge's 63-year history. It was 8 percent ahead of the first four months of 1953, the previous high.

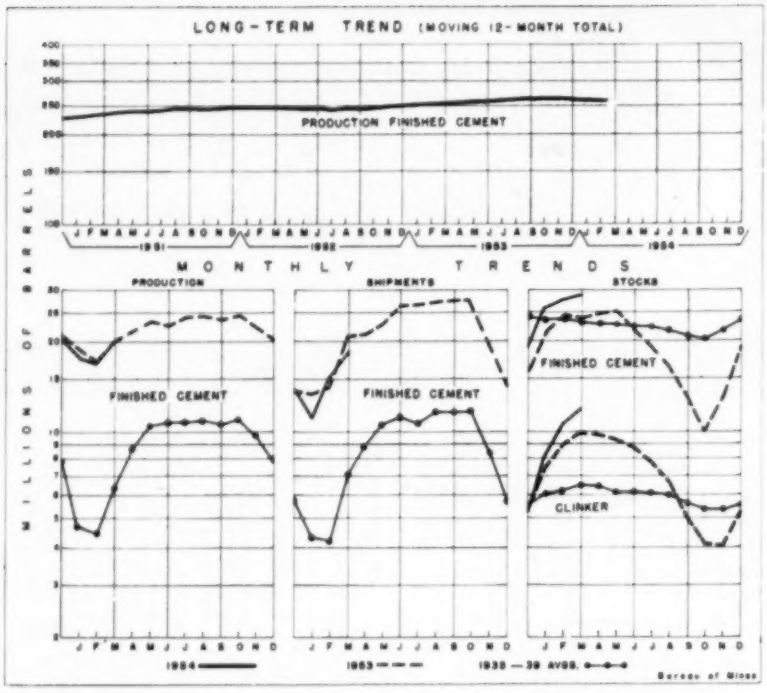
Thomas S. Holden, vice-chairman of F. W. Dodge Corporation, commented: "The extremely high April totals indicate a continuation of the unprecedented boom in construction activity reported thus far in 1954. Contract awards in January, February, and March of this year set all-time monthly records for those months. The April figures, while they are second-highest for that month, actually indicate no slackening of pace.

"As these contract awards are widely used as an indicator of economic trends, it is important to note that April of this year cannot be strictly compared with April of last year because of the inclusion of a considerable amount of atomic energy work in last year's April figure.

"If this unusual item is disregarded in last year's April total, what might be called 'ordinary' contract award activity in April of this year was well ahead of last year."

Other April figures: nonresidential: $605,427,000, up 14 percent over March but 11 percent lower than April, 1953; residential: $796,133,000, up 19 percent over March and 18 percent over April, 1953; public works and utilities: $290,308,000, down 11 percent from March and 25 percent from April, 1953.

The four-month figures: The total of Dodge Reports was $5,592,632,000, up 8 percent over 4 months in 1953. Non-residential was $2,079,276,000, up 9 percent over the first four months of 1953. Residential was $2,435,125,000, up 13 percent. Public works and utilities was $1,078,231,000, down 4 percent.



SUMMARY — Production of finished portland cement in March, 1954, as reported to the U.S. Bureau of Mines, totaled 20,084,000 barrels — 1 percent less than in March, 1953. Mill shipments totaled 18,740,000 barrels — 10 percent lower than in March, 1953 — while stocks of 28,906,000 barrels of finished portland cement on hand at the end of the month were 21 percent higher than those on hand on March 31, 1953. Clinker production during the month amounted to 22,003,000 barrels — 4 percent more than in March, 1953.

PRODUCTION — One hundred and fifty-six (156) plants located in 37 states and in Puerto Rico reported a production of 20,084,000 barrels of finished portland cement during the month, compared to 155 plants which manufactured 20,215,000 barrels during the month of March, 1953. Clinker production during the month was 22,003,000 barrels, compared to 21,179,000 barrels in March, 1953. Cumulative reports for the first quarter of 1954 show that production and shipments of portland cement are 3 percent and 7 percent lower, respectively, than in the first quarter of 1953.

SHIPMENTS — Mill shipments of finished portland cement totaled 18,740,000 barrels, 10 percent less than in the same month of the previous year. Shipments were higher in 4 districts and lower in 16 districts, compared to shipments in March, 1953. Percentage increases of 13 percent and 9 percent, respectively, occurred in the Oregon-Washington and eastern Pennsylvania-Maryland districts, while the Iowa, Illinois, western Pennsylvania-West Virginia, Tennessee, and northern California districts showed declines in excess of 25 percent. Cumulative first quarter totals show that the greatest percentage declines in shipments for the current year were in the western Pennsylvania-West Virginia, Iowa, Illinois, and northern California districts.

STOCKS — Mill stocks of 28,906,000 barrels of finished portland cement were on hand on March 31, 1954 — 21 percent more than at the end of March, 1953 — while stocks of clinker totaled 11,917,000 barrels — 20 percent higher than on the same date a year ago.

California Portland to Build 2,000,000-Bbl. Plant at Mojave

Plans for the construction of a 2,000,000-bbl. per year cement plant near Mojave, Calif., have been announced by officials of the California Portland Cement Company, which now operates a plant at Colton, Calif., and a third (through its subsidiary, the Arizona Portland Cement Company) at Rillito, Ariz.

According to Wallace K. Downey, general counsel for the firm, it is expected that the plant will be in operation within 20 months. He stated that there is sufficient raw material at the new site for "100 to 150 years". Production of 6,000 bbl. a day, or 2,000,000 bbl. annually, is anticipated initially; but officials expect to increase the capacity to four times that volume eventually.

Building, Machinery Destroyed In Fire at Canadian Plant

Fire which gutted a large Quonset hut maintenance shed at the Limestone Products Ltd. quarries at Uhthoff, Ont., caused damage estimated at $150,000 to $200,000. The blaze began with a heavy explosion.

A large power shovel and other machinery, stored in the hut for the winter, were destroyed.

Gypsum Industry Cited, Plants Receive Awards For High Safety Scores

The gypsum industry has reduced its accident-frequency rate approximately 40 percent in the last 10 years, according to Lloyd H. Yeager, general manager of the Gypsum Association. Despite an 80 percent increase in the total number of man-hours worked, he reported, there were 154 fewer lost-time accidents in the industry's operating plants last year than in 1944.

The industry's safety record in 1953, he revealed, showed a 6 percent improvement over that of the previous year. Gypsum plants, with a total of 25,000,000 man-hours worked last year, had only 8.95 disabling accidents per 1,000,000 man-hours, compared with 9.51 lost-time accidents per 1,000,000 man-hours in 1952.

Noting that the accident rate in gypsum mill, mine, and quarry operations is now at an all-time low, Mr. Yeager expressed the opinion that "no other major industry has equalled the rapid improvement in safety performance achieved by the gypsum producers". To reduce the accident rate still further, he said, the Gypsum Association plans to intensify its safety program, which includes the showing of specially prepared motion picture films to all employees, the periodic distribution of safety news bulletins to all labor supervisors, and regular safety meetings attended by all plant workers.

Mr. Yeager's report was presented at the annual meeting of the Gypsum Association in the Edgewater Beach Hotel, Chicago, at which awards were presented to winners in safety contests conducted in 50 gypsum producing plants during the last year.

The United States Gypsum Company plant at Gypsum, Ohio, won the trophy in Class A., which comprises plants having worked 600,000 or more man-hours in a 12-month period.

Blue Diamond Corporation's plant at Blue Diamond, Nev., was the winner among the Class B plants, those having worked between 425,000 and 600,000 man-hours in the year. Among the Class C plants (between 275,000 and 425,000 man-hours) Certain-Teed Products Corporation's perfect scores were achieved by the plant at Sigurd, Utah, and the United States Gypsum Company's plants at Sigurd, Utah, and Heath, Mont.

The National Gypsum Company's plant at Akron, N. Y., won the Class D trophy, sought by plants which worked fewer than 100,000 man-hours a year. Other plants in this group which reported no disabling accident were those of the Kaiser Gypsum Company at Redwood City, Calif.; of the Ideal Cement Company at Portland, Colo., and Hanover, Mont.; and of the United States Gypsum Company at Milwaukee, Wis.

Lloyd H. Yeager

Cover Picture....

● A prize-winning photograph appears on our cover this month. It took first place in the products class of a photography contest sponsored by the American Association of Industrial Editors. John Dubas, staff photographer of Dravo Corporation, Pittsburgh, made the shot, which shows gravel riding conveyor belts from a heavy-media separation plant and dredge operated by Dravo's Keystone Division during barge-loading on the Ohio River.

Federal Aid Highway Act Allows $960,000,000 Yearly For Fiscal Years, 1956, 1957

Under the Federal Aid Highway Act of 1954 an all-time high appropriation of $966,000,000 annually has been authorized for the fiscal years of 1956 and 1957. Of this total, $875,000,000 is earmarked for distribution to the states, on a matching basis, for improvement of the four Federal Aid highway systems, as follows: primary system, $315,000,000; secondary system, $210,000,000; urban system, $175,000,000; and interstate system, $175,000,000.

This act incorporates a change in the traditional 50-50 matching basis with respect to authorization for the interstate system. Funds will be allocated on a 60-federal, 40-state basis. One-half of the interstate authorization will be apportioned among the states in the ratio which the population of each one bears to the total population; the other half will be apportioned under the primary Federal-aid formula, namely on the factors of ⅓ mileage, ⅓ area, and ⅓ population.

The 1954 act provides a $300,000,000 increase (52 percent) over the present annual authorization of $575,000,000 for the Federal Aid systems.

N.Y. Group Acquires Control Of Keystone Portland Cement

Controlling interest in the Keystone Portland Cement Company, Bath, Pa., was bought recently by a group of investment bankers headed by Shields & Company.

The syndicate acquired for cash 82,274 shares of the 136,434 outstanding, which represents a 60 percent interest. Macrae Sykes, a partner of the Shields concern, was elected a director of Keystone.

Subsequently Shields & Company placed on the market 330,296 shares of common stock of Keystone Portland Cement, priced at $15,375 per share (par value $3 per share).

At Florence, Mass., a recently completed modernization of the Bill Willard, Inc., plant has increased daily production to 1,200 tons of washed sand and gravel. The firm also produces ready-mixed concrete. The plant now covers 90 acres.

MAURICE F. DUFOUR has been elected assistant vice-president of the Freeport Sulphur Company of New York.

Maule Industries Invests Over $4,000,000 to Buy Florida Plants, Properties

In two transactions involving several millions, Maule Industries, Inc., Miami Beach, Fla., recently acquired properties which will figure in a major expansion move.

Company reports show that Maule paid $3,077,000 for the Miami Crushed Stone Company, the Peninsular Concrete Company, the Material Sales Corporation, and Tropical Farms. In a later deal the company gave $1,339,743 for the operating assets of the Alfred Destin Company, the Destin Block Company, and other assets owned by the principals of these companies.

It was stated that Maule acquired 940 acres of quarry lands through the purchase of Tropical Farms and the Destin companies. In addition the firm bought 2,195 acres in Dade and Broward counties. These acquisitions provide the company with rock reserves in excess of 100,000,000 cu. yd. At the present rate of production, this means that Maule will have reserves for at least 30 years of operation, perhaps 35 years.

Six Appointments Announced On Gen. Crushed Stone Staff

The following changes in the personnel of the General Crushed Stone Company, Easton, Pa., were announced recently:

Meredith Bovee, formerly general superintendent, has been appointed general operating consultant. Mr. Bovee will be succeeded by Edwin E. Dotter, who was formerly assistant general superintendent.

J. K. Scott, who has been assistant district sales manager of the firm's Rochester, N. Y., territory, has been appointed district sales manager. His assistant will be John C. Haves, formerly superintendent of the Corning, N. Y., plant. Harold Hickox, who was formerly at the Watertown, N. Y., plant, is acting superintendent at Corning.

George E. Schaefer has been named district sales engineer at Rochester; he was previously sales manager in this district.

25 Lightweight Units Added To Permanente's Hauling Fleet

Authorization for the purchase of 25 new diesel trucks and trailer units of the latest lightweight construction was granted recently by the board of directors of the Permanente Cement Company. One of these units, designed for bulk cement delivery, will carry a payload of 143 bbl. of cement, against 120 for the old type. Utilization of aluminum on the tractors and the bulk cement tanks of the trailers has made possible the addition of 8,000 lb. additional payload per trip.

When delivery on the trucks has been completed this summer, Permanente will have its own fleet of 32 lightweight bulk trucks and two lightweight flat-bed rigs, the latter with a payload of 580 sacks of cement, compared with 500 on the present flat-beds—a gain of 7,500 lb. per haul. Of the 34 tractors, 33 will be powered with 200-hp. engines; the other with a 300-hp. unit for mountain hauling. Total investment in the new equipment will be in excess of $800,000.

The Warner Company, Philadelphia, Pa., in its annual report states that net sales and other income amounted to $23,028,348 in 1953, an increase of 8.4 percent over those of the preceding year. Net income for 1953 was $2,748,249 ($5.79 per share), while the figure for 1952 was $2,267,893 ($5.01 per share).

$30,000,000 Expansion Plan Revealed by M. H. Baker For Natl. Gypsum Company

Stockholders of the National Gypsum Company were told at their annual meeting of a long-range expansion plan costing from $30,000,000 to $35,000,000. Chairman Melvin H. Baker presented the outline of the project, and also predicted that the firm's volume of business in 1954 will prove to be as high as last year's. Profits for the first quarter rose from $1,878,529 (in 1953) to $2,668,258.

The company's directors approved a $6,000,000 outlay for the development of National's recently discovered gypsum deposit in Nova Scotia, reported large enough to supply the world for the next 50 years. Other capital improvements will bring the total for this year to $10,000,000.

A $4,000,000 refinery and storage installations are being built at Columbia Park, Ohio, by the American Bitumuls & Asphalt Company on a 100-acres site.

Recent Lime Sales Decline; 1953 Sets All-Time High

In November, 1953, domestic sales of open-market lime, according to reports of producers to the U. S. Bureau of Mines, amounted to 625,700 short tons. In December, 1953, the total was 599,610 short tons, a decrease of 4 percent from the previous month. Sales for the 12-month period (January to December, 1953) reached an all-time high of 8,356,546 tons.

January, 1954, sales, 572,907 short tons, again dropped 4 percent from December, 1953. Building and agricultural uses increased over the previous month, whereas decreases were noted for refractory, chemical, and other industrial uses.

The sales total was recorded as 571,510 short tons during the month of February, 1954, compared with 572,907 tons for January. As in January, sales for agricultural and building uses increased, while other applications showed a declining trend. The table shows sales by types and major uses.

Lime Sold by Producers[1] in the United States, in Specific Periods of 1953-54, by Types and Major Uses, in Short Tons

	December 1953	January 1954	February 1954	February 1953
By types:				
Quicklime	476,453	449,892	429,836	528,200
Hydrated lime	123,157	123,015	141,674	136,807
Total lime[2]	599,610	572,907	571,510	665,007
By uses:				
Agricultural				
Quicklime	5,768	[3]3,682	6,555	2,981
Hydrated lime	7,240	[3]8,623	15,258	14,714
Total	13,008	[3]12,305	21,813	17,695
Building:				
Quicklime	13,488	13,224	14,880	14,209
Hydrated lime	57,227	58,300	68,382	63,590
Total	70,715	71,524	83,262	77,799
Chemical and other industrial:				
Quicklime	233,338	[3]287,871	267,502	324,474
Hydrated lime	58,690	[3]56,092	58,034	58,503
Total	352,028	[3]343,963	325,536	382,977
Refractory (dead-burned dolomite)	163,859	145,115	140,899	186,536

[1]Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2]Approximately 60 percent of lime produced is high-calcium and 40 percent high-magnesium.

[3]Revised figure.

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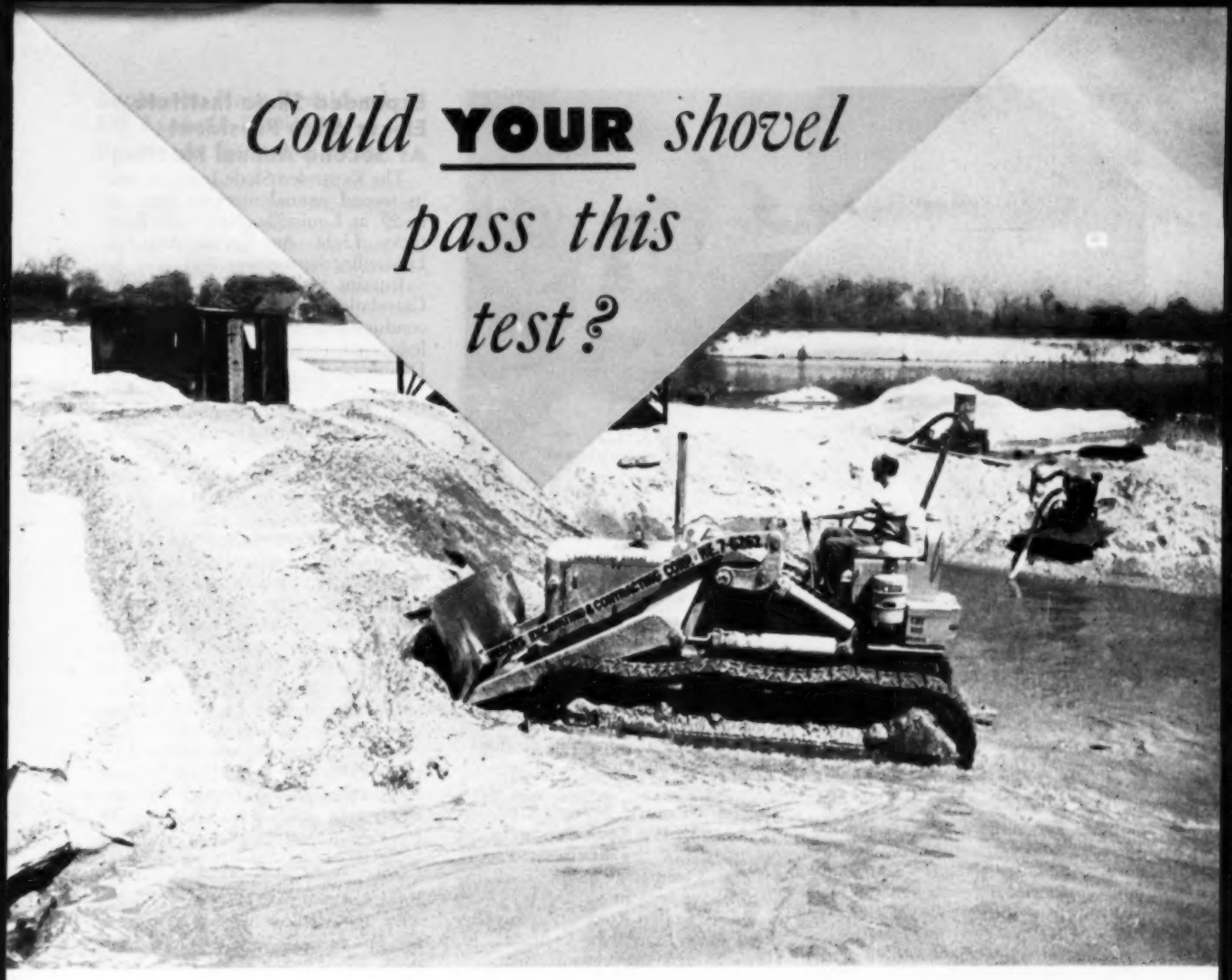

LOADING TRUCKS with sand and gravel, this Caterpillar No. 6 Shovel must often slug track frame-deep through abrasive muck. It's an extreme test of Caterpillar filters and seals, which protect factory-machined precision by keeping lubricants *in* and grit *out*.

It's also a test of the traction and balance of this newest shovel in the Caterpillar line. Tractor, engine and bucket are engineered as a unit so that tracks will not "dance" with even the heaviest loads. This No. 6 Shovel can work in areas too tight for a crane. "We decided on it from our previous experience with Cat® equipment, and because we needed one machine that would do several different jobs," says G. W. Bilzi of Heroes Excavating & Contracting Corp., East Meadow, Long Island, N. Y. The company is 75% standardized on Caterpillar products, with eight other Cat track-type Tractors.

Here are some of the other jobs this machine-of-many-uses can perform: load, stockpile, strip, 'doze, clean up and grade. It is compact and maneuverable for work in tight places. Controls are hydraulic for easy, accurate operation, and mounted low for excellent operator visibility. The two-yard bucket is simultaneously raised and dumped *clean* for fast cycle time. Thanks to its exclusive fuel injection system, the rugged Cat Diesel Engine delivers full and *foul-free* power at a cost of only pennies per hour with money-saving No. 2 furnace oil.

Your Caterpillar Dealer will demonstrate *on the job* the shovel that will do most work for you at lowest cost. Talk over your needs with him today. And count on him —any time, anywhere—for fast, skilled service and dependable Caterpillar parts.

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• A bulldozer operator forgot one of the principal safety rules upon leaving his machine after a day's work—he left his dozer blade up. Don't let it happen at YOUR plant. Because of this, the machine can become a deadly weapon, particularly when a group of curious kids start climbing over and under the unit and pulling all the levers they can lay their hands on. This is a scene from Caterpillar Tractor Company's new film, "The Gamblers".

Pit and Quarry Wins Award Of National Safety Council

The National Safety Council's 1953 Public Interest Award, a non-competitive presentation made annually to public information media for exceptional service to safety, went to 28 daily and eight weekly newspapers, 72 radio and 17 television stations, two radio networks, 32 advertisers, 14 outdoor advertising companies, and 13 general circulation and 27 specialized magazines. One award went to PIT AND QUARRY, listed as a specialized magazine.

In announcing the list of award winners, Ned H. Dearborn, president of the National Safety Council pointed out: "Nominations for these awards reveal more and more acceptance by mass communication media of their responsibility in helping to solve one of the great social problems of our time. Their initiative and skill are spearheading the public information effort and really giving safety a voice that can be heard."

Canadian Potash Concern Exploring in Saskatchewan

According to an announcement made recently by officials of the Potash Company of America, this firm has formed a wholly-owned Canadian subsidiary, which will be known as the Potash Company of America, Limited. The new concern was set up to continue exploration work initiated in Saskatchewan two years ago.

Major item on the program is additional drilling under a prospecting permit to develop a favorable shaft site. In the event that an exploratory shaft is sunk and the results prove successful, P.C.A., Ltd., will proceed with plans for a plant and early production.

The purpose of these explorations is to develop additional ore reserves for the firm and thus to insure long-time operation.

Southern Pacific Milling Co. Buys Montalvo Rock Property

Officials of the Southern Pacific Milling Company, Santa Barbara, Calif., have announced the purchase of the Montalvo Rock Company, located near Montalvo, Calif. L. R. Howard, owner of the newly acquired company since 1928, is retiring from business.

The Montalvo plant, which covers an area of more than 400 acres, produces crushed rock, sand, gravel, and batch and transit-mixed concrete for Ventura and southern Santa Barbara counties.

Southern Pacific Milling is currently engaged in a major expansion program. All efforts are now concentrated upon the production of aggregates and allied building materials; and the firm's lumber mills and warehouses have been sold. The company operates 14 aggregates plants.

According to Jake Will, Southern Pacific Milling Company's president, there will be few personnel changes. Montalvo will retain its name and will be considered a division of the parent firm. L. C. Root will be in charge of operations at Montalvo.

CHARLES J. FEENEY, former secretary of the Pioneer Sand Company of St. Joseph, Mo., has been elected president of that firm to succeed M. O. Land, who died last year.

Expanded Shale Institute Elects Allen President At Second Annual Meeting

The Expanded Shale Institute held its second annual meeting April 24 to 27 at Louisville, Ky., with Kentucky Light Aggregates, Inc., of Louisville, the member host.

Interim results of the Institute's Correlation Research Project being conducted at the University of Toledo were revealed to the members. Details of the operation of the institute's Plastic Flow Research Project were outlined by the Technical Committee. This work is being conducted at Kansas State College under the direction of Professor Charles Scholer and will be made on four of the members' aggregates.

Slayton Jenner of the Federal Civil Defense Agency acquainted the members with the methods by which industry may participate in Civil Defense Atomic Blast Resistance Tests.

At a session open to architects, engineers, and builders a talk on *Good Workmanship with Concrete Masonry* was presented by John Mallon, vice-president of the Louisville Cement Company. He was followed by Carl Wallace of the Portland Cement Association, who presented a stimulating talk on *Concrete Masonry in Building Construction.*

Newly-elected officers for the year are W. W. Allen, Hydraulic-Press Brick Company, St. Louis, president; Alex R. McVoy, Texas Industries, Inc., Dallas, first vice-president; William E. Thomas, McNear Brick Company, San Francisco, second vice-president; George Bickel, The Featherlite Corporation, Austin, Tex., secretary; A. R. Waters, The Carter-Waters Corporation, Kansas City, Mo., treasurer.

The Institute maintains offices in Washington, D. C., under the direction of Frank G. Erskine, managing director.

Memphis Firm Wins Suit After Fatal Highway Accident

At Memphis, Tenn., a Federal Court jury on April 17 returned a verdict that the Memphis Stone & Gravel Company was not liable in a $215,000 suit brought against it for the deaths of two persons and injuries to two others in a highway crash involving a truck hauling the firm's gravel.

Defense of Memphis Stone & Gravel was that the truck driver was not its employee and that therefore the firm was not responsible. He was employed by the owner of the truck, who contracted to haul the gravel for the concern.

Buchanan New President Of Asphalt Institute— Succeeds Bernard Gray

The election of J. E. Buchanan, now president of the University of Idaho, to the presidency of The Asphalt Institute, effective July 1, has been announced by Raymond Harsch, chairman of the executive committee. Bernard E. Gray, president of the institute, will retire.

The Asphalt Institute is a nonprofit organization sponsored by members of the petroleum industry here and abroad to further the application and extension of uses of petroleum asphalt, through engineering activities and research.

Mr. Gray, a noted highway engineer, began his career in 1909 as a member of a surveying crew. He was for several years resident engineer with the Massachusetts Highway Commission and subsequently (after serving in World War I) served as senior highway engineer for the U.S. Bureau of Public Roads, in charge of early Federal Aid projects. In 1921 he was appointed division engineer and later chief engineer of maintenance in West Virginia.

In 1930 Mr. Gray joined the staff of the Asphalt Institute, and since that time he has served in several important posts, most recently as president. He is the author of several hundred technical articles.

J. E. Buchanan

Bernard E. Gray

From 1923 to 1936 Mr. Buchanan worked with construction firms and also in the materials testing laboratory of the Idaho Bureau of Highways. During the next two years he was research engineer with the Asphalt Institute, Pacific Coast Division. He joined the faculty of the University of Idaho in 1927 as an instructor in civil engineering. In 1938 he was named dean of the College of Engineering, director of the engineering experiment station, and professor of civil engineering. After serving for four years in World War II and attaining the rank of Lieutenant Colonel, he returned to civilian life and in 1946 was named president of the University of Idaho.

Old N.Y. Limestone Caverns Yield Subterranean Crops

Limestone caves along the Hudson River near Kingston, N.Y., which were once worked for raw material that went into the famed Rosendale cement now house what is reportedly the largest mushroom-growing business in the world. As described in a recent issue of *Harvester World*, an International Harvester publication, the Knaust Brothers, who began their underground mushroom farming operation in the abandoned caves about 30 years ago, now raise more than 15,000,000 pounds of the epicurean fungus each year.

The gloomy, damp atmosphere of the Kingston caves is ideal for the strange subterranean crop, which is scientifically cultivated and harvested by pickers who wear miners' headlamps. Largest of the caves is the Binnywater, which covers 31 acres. Control equipment keeps the temperature between 54 and 56 deg. F. at all times.

Herman and Henry Knaust have their own laboratories for testing soils and composts and for raising mushroom spores under sterile conditions. Many growers now are using a compost which is mainly synthetic. Ingredients of such artificial composts are trade secrets, of course.

● At the entrance of the Binnywater cave a truck used for deliveries is seen leaving the huge underground mushroom farm.

● Scene inside Binnywater cave, where pickers are at work harvesting the white "buttons" from trays, by the light of their miners' headlamps.

● A scene in the Auxvasse Stone and Gravel Company's quarry near Auxvasse, Mo. The Caterpillar diesel D337 engine provides power for the Joy compressor which furnishes compressed air for drilling operations. The company, affiliated with the Samuel Kraus Company, is headed by Mr. Kraus, who is president and general manager. M. Markwell is vice-president and secretary. Products of the firm's two plants include agricultural limestone, crushed limestone, and concrete aggregates.

Empire State S.G.-R.M. Assn. Holds Third Annual Meeting

The third annual meeting of the Empire State Sand, Gravel and Ready Mix Association was held on May 10 and 11 at the Hotel Statler in Buffalo, N. Y.

At the first technical session *Application of the Principles of Percentage Depletion for the Sand and Gravel Industry* was discussed by Paul J. Kremer, Buffalo Slag Company, and H. H. Kirwin, Eastern Rock Products, Inc., Utica. This meeting was followed by a presentation and discussion of materials-handling equipment under the sponsorship of the associate members.

Other speakers included Senator Walter J. Mahoney, majority leader, New York State Legislature; Paul R. Jones, Gates-McDonald & Company, Unemployment Consultants; Alfred B. Hoftiezer, safety superevisor, Laverack and Haines, Inc.; and Russell P. Mumford, Beckley & Myers, Springfield, Ohio. (Mr. Mumford's company received the N.R.M.C.A. 1953 Class C safety award.)

Those attending the meeting visited three plants, those of the Federal Portland Cement Company, George C. Frey Ready Mixed Concrete, Inc., and Gravel Products Corporation.

Sludge from Water Softener Calcined at Lansing, Mich.

The April issue of *Limeographs*, official publication of the National Lime Association, carries an interesting item concerning a civic project carried at Lansing, Mich. We quote: "Faced with a mounting lime sludge disposal problem as a result of water softening, the city of Lansing, Mich., is constructing a plant to calcine the sludge for re-use. The plant features a 30-ton-per-day Fluo-Solids lime kiln, designed around a process developed by Lansing's board of water and electric light commissioners.

The report explains that in Lansing's water-softening plant lime is utilized to reduce the hardness from about 425 p.p.m. to 85 p.p.m. In the newly-developed process most of the magnesium compounds present in the lime sludge (10 to 15 percent solids) are removed in a centrifuge, which also dewaters the sludge about 75 percent. Hot waste kiln gases dry the sludge completely. Tackiness of the wet sludge is controlled by returning a portion of the dried lime sludge to it.

Calcining of the dried sludge (mixed with 1 percent soda ash) in the kiln is the next step. Maximum capacity is 35 tons of lime per day. The soda ash melts and causes the lime particles to agglomerate and form pellets, which present no dust problem. These pellets, about the size of buckshot, are hard and dense; they are resistant to air slaking, but hydrate readily. It is reported that the process can produce lime analyzing 95 percent CaO.

Dissolution of the partnership of Paul B. Procter and J. H. Gray Jr., Barstow, Calif., and formation of a corporation was announced recently by these two crushed stone plant operators. They have transferred their business and assets to the newly formed corporation title of the Mojave Rock Material Company.

NEAL R. FOSSEEN, president of the Washington Brick & Lime Company, Spokane, was elected president of the Association of Washington Industries at a recent meeting.

Davison Begins Producing Triple Superphosphate At $10,400,000 Plant

Production of triple superphosphate has been started in the $10,400,000 plant erected by The Davison Chemical Corporation on a 45-acre site near its phosphate rock mining properties in Bartow, Fla. Output will be stepped up to the plant's 200,000-tons-a-year rated capacity as soon as possible.

The new plant will make the company the second-largest producer of the chemical and will be an important addition to the expanding industrial economy of Florida, which contains the largest known reserves of phosphate rock east of the Mississippi River.

Davison's production will be added to a current industry output of approximately 1,000,000 tons annually, of which nearly 80 percent is produced in Florida. By the end of this year total demand is expected to reach 1,600,000 tons, based on forecasts by the United States Department of Agriculture.

Consolidated Engineering Corporation of Baltimore were the construction contractors for the triple superphosphate plant, with the Dorr Co., Stamford, Conn., as architect-engineers.

Operation is under Davison's Florida Phosphate Division, Dr. Allen T. Cole, manager. Sales are handled through the company's Heavy Chemicals Department at Baltimore, with William Caspari Jr. serving as general sales manager.

Operator Wins Legal Battle Caused by "Nuisance" Charges

After a long legal fight in county and district courts of California Hamilton Morton of Redwood City won the right to operate a quarry near that city. A 16-page opinion written by Justice Raymond Peters of the district court of appeals in San Francisco contained the following statement: "An absolute prohibition . . . practically amounts to taking of the property since it denies the owner the right to engage in the only business for which the land is fitted."

Although a preliminary injunction had been issued against the operation of the quarry last year, it had been set aside, and the plant was operated on a temporary basis for several months. Residents in the neighborhood charged that the business caused excessive dust, noise, and traffic hazards. Mr. Morton and the county planning commission will seek to work out regulations governing satisfactory operation of the quarry.

30 years ago in Pit and Quarry

By W. E. TRAUFFER

THE June, 1924, issue of PIT AND QUARRY featured a detailed report of the sixth annual convention of the National Lime Association, which was held at White Sulphur Springs, W. Va., May 20 to 23. Judging from this report, the meeting was well attended; and much important information was disseminated under the guidance of President George B. Wood and General Manager Burton A. Ford. The business sessions showed that there was a marked increase in the technical control of lime manufacture and an influx of technically trained men into the industry. It was also reported that, as a result of the fellowship research program, more than 30 men outside the lime industry were engaged in chemical lime research.

Also in this issue were several more of the series of special articles on timely and important subjects written exclusively for PIT AND QUARRY by leading authorities on these subjects. *The Freight Rate Situation Today* was analyzed by Joseph H. Donnell, a former member of the ICC. Much of his advice would be just as good today as it was then.

A comparison of the English and American lime industries was made by C. W. D. Rowe, managing director of The Dunstable Lime Co., Ltd., Petersborough, England, a recent visitor to this country. In England, he said, there were several associations of lime manufacturers but no national body working for the industry as a whole. A much larger number of types of lime were also made. Mr. Rowe pointed out the differences in the uses of various limes in the two countries and also differences in production methods and equipment due to the different conditions existing. The common type of kiln in England, he said, was the direct-feed shaft type employing coke. The increasing cost of coke was creating a trend toward gas kilns, Mr. Priest stated. He mentioned the Priest kiln, which by employing preheating and waste heat boilers obtained a fuel ratio as high as 7 to 1.

Hydrated Lime as a Water Softener was the third exclusive article, by John J. Schommer, assistant professor of chemistry at Armour Institute of Technology. He pointed out the losses incurred by various industries by the use of untreated water containing various substances in solution or suspension. Most of these losses could be prevented by the use of lime which, he said, was cheaper than other chemicals that could be used for such treatment and in most cases it did at least as good a job.

In this June, 1924, issue were two detailed and profusely illustrated descriptions of plants operated by the United States Gypsum Company. One article described the lime plant at Genoa, which had just been enlarged for the fourth time since it was built 8 years before. Its capacity was then 500 tons of lime daily from 40 shaft kilns.

The other U. S. Gypsum Co. installation was the new gypsum plant at Sweetwater, Texas, the 22nd owned by the company. Included was a mill for wallboard and other products.

Another detailed article told how the concrete brick plant of the Shope Brick Company of Wisconsin had undergone tremendous growth in its less than three years of existence. In its first year more than 3 million brick were produced; in its second year production was over 6 million brick; and in 1924 output was expected to exceed 8 million.

An announcement in this issue told of the appointment of Harold Walker Munday as editor of PIT AND QUARRY. A graduate civil engineer from Armour Institute and Purdue University, Mr. Munday had for some time been an associate editor. Also announced was the decision to publish PIT AND QUARRY on a semimonthly basis beginning in the near future.

U. S. Geological Survey Lauded by Pres. Eisenhower

At a recent White House gathering, President Eisenhower commended the United States Geological Survey for its scientific achievements and its contributions to the economic and cultural development of the nation. The president received the survey's director, William E. Wrather, accompanied by Secretary of Interior Douglas McKay and Assistant Secretary Felix Wormser, on the occasion of the Survey's 75th anniversary.

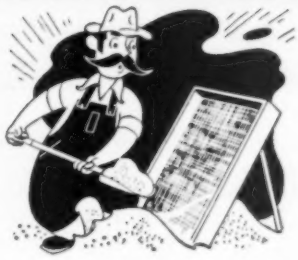
Established in 1879, the survey has centered its activities around the scientific discovery, evaluation, and conservation of minerals, land, and water resources. Dr. Wrather, who has served as director since 1943, was recently honored by four American engineering societies, which awarded him the John Fritz Medal, the highest award of the engineering profession. The citation recognized him as "a geologist of world wide experience and fame, an outstanding scientist and historian, and distinguished for his service to the nation".

J. LUTHER TEAFORD has been selected executive vice-president and treasurer of Liberty Limestone Corporation, Buchanan, Va.

Photo by Abbie Rowe—Courtesy National Park Service

• On the occasion of the 75th anniversary of the founding of the Geological Survey, President Eisenhower received Dr. W. E. Wrather, distinguished director of the Survey. Shown here in the White House Executive Office are President Eisenhower, Dr. Wrather, Assistant Secretary of the Interior Felix Wormser, and Secretary of the Interior Douglas McKay, who introduced Dr. Wrather to the President.

Screenings



by William M. Avery

EVERY now and then this department accumulates a backlog of miscellaneous oddments far in excess of its normal requirements. When this happens, we must make a choice between jettisoning the surplus or shooting if off all at once like a pack of Chinese firecrackers. The following items, all garnered within a few weeks, could unquestionably be classified as expendable without any irreparable loss to the literature of our times, but each appears to have just the touch of mild madness necessary for inclusion here.

A waitress in California has brought suit against the manager of a gravel pit, charging that she was threatened with the loss of her job in an exclusive Hollywood restaurant unless she invested her $10,000 nest egg in the gravel business. In our opinion the guy would have made a much smarter deal if he had given her the gravel pit in exchange for her job.

In presenting safety awards to various employees for accident-free performance of duties, the Midland Concrete Company of Midland, Texas, handed a one-year certificate to Miss Billie Theriaut, secretary. Our source of information doesn't indicate the precise nature of the job hazards, but evidently the young lady got through a whole year without acquiring either a hangnail or a husband.

The Mayor of Calcutta, India, has been petitioned by 300 dhobis (laundrymen who wash clothes by beating them on stones) to set aside a recent increase in rentals for stones at the washing tanks. Seems the monthly rental had been jumped from $1.26 to $1.68 per stone. This looks to us like a plausible opening for another United States subsidizing operation, and we trust that a Senate investigating committee will be sent off to Calcutta just as soon as they can pry enough of the boys away from the McCarthy-Army hassle.

According to a recent release from the National Safety Council, "more than 15,000,000 women in the United States are employed outside their homes. They labor almost everywhere, from foundry to corporation president's office, and they are often pursued by myths concerning their physical and emotional suitability for production work." We'd just like to mention that most of the myths that pursued women around the places we've labored haven't shown too much concern regarding their physical and emotional suitability.

Look Out, Mountain

THERE appears to be a minor row brewing as to whether the accumulation of blasted stone at the base of Mount Rushmore national monument should be cleared away or left as is. Pointing out that the huge

mountain carvings are expected to last for 500,000,000 years, one newspaper writer wants to know if vacationing spacemen millions of years from now will hop from their rocket ships and point an accusing finger at 20th century earthman and his slipshod housekeeping. As far as we're concerned, we'd be pretty happy if that were the worst sin of omission or commission that could be charged to our century. The way we're behaving just now, there's some doubt in our mind that we'll leave enough unpulverized real estate on this tired old planet for those vacationing space fellows to land their rocket ships.

Ersatz Unlimited

WE DON'T suppose the total market for sand and vermiculite will increase substantially, but anyhow the movie people have used fairish quantities of these two materials to solve a couple of problems encountered recently in location filming. Warner Brothers, in filming "Them!" out on the Mojave Desert, shipped in several huge truckloads of sand to pinchhit for the local material in sequences featuring a wind storm. Regular old Mojave sand, dampened by a rainstorm, just wouldn't create the desired effect. In filming "The White Stallion," Columbia Pictures used 800 bags of vermiculite to simulate quicksand, a performance in which this versatile nonmetallic mineral appears to excel. The only thing we're just a bit curious to know is what the picture lads would use in place of vermiculite, if they just happened to need vermiculite in one of their epics.

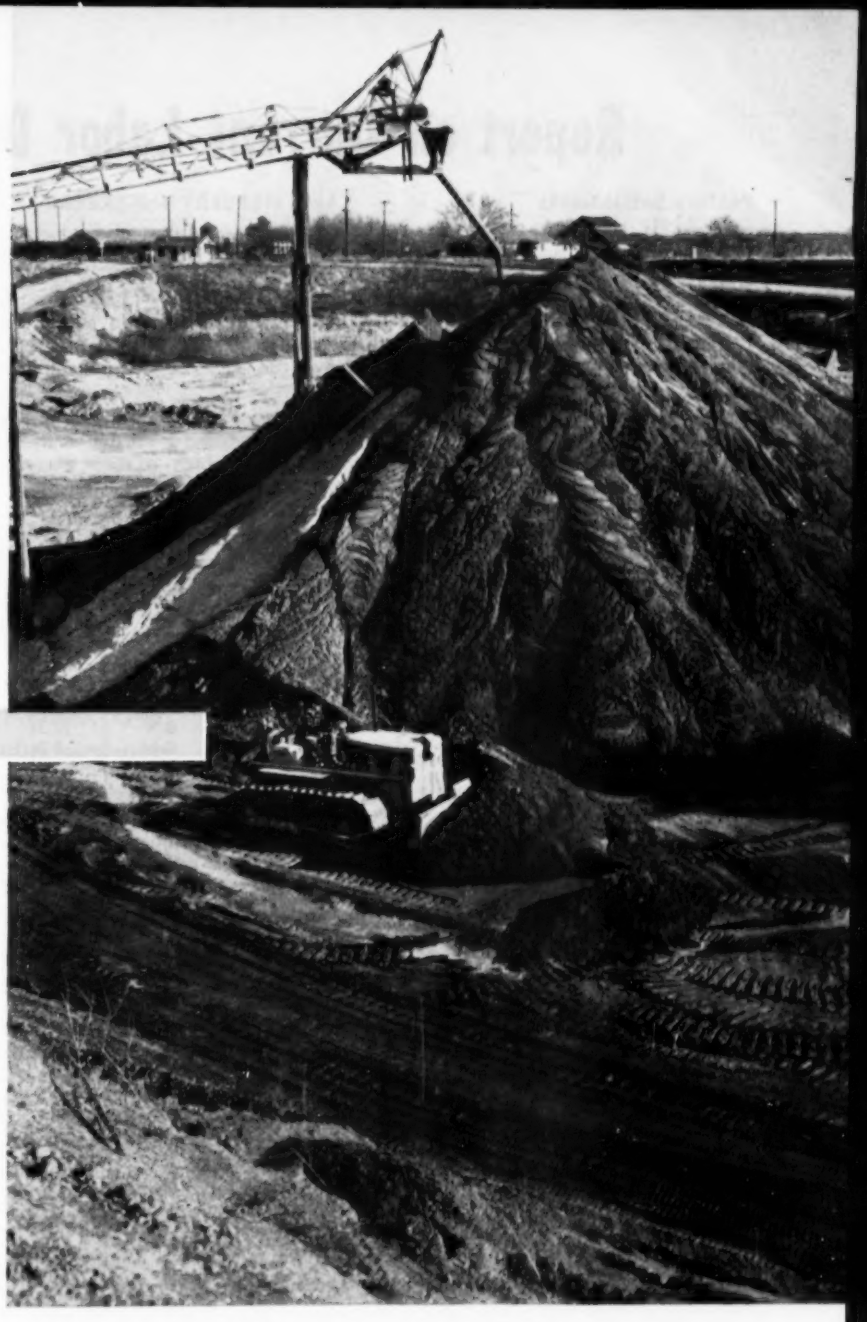
Not-So-Light Fantastic

WE have just learned, *via* the Huntington, Ind., *Herald-Press*, that Noel E. Scott, who was employed with the United Shoe Machinery Corp. of Boston for several years, has been made assistant head of the Cement Shoe Division of the St. Louis district. We thought we were reasonably well informed on at least the major uses of portland cement, but this one catches us (and leaves us) flat footed, so to speak. Come to think of it, though, the guy who stepped on our foot at the recent National Crushed Stone Association dance must have been wearing a pair. Made quite an impression on us at the time.

Consideration

ACCORDING to a recent issue of the *Vermiculite News*, the ceilings of a gambling hideaway at Wilders, Ky., have just been treated with vermiculite acoustical plaster to deaden the racket of dice, roulette wheels, bird cages, and poker chips. We suppose it also helps to muffle the groans of bereft patrons.

"DOING A FINE JOB ALL OVER THE PLANT"



This Caterpillar D7 Tractor with matching No. 7S Bulldozer is kept on the go at a rock-crushing plant near Tracy, Calif. Owned by Tracy Rock and Gravel Co., it works on the surge pile, feeds the primary crusher, cleans up around the shovel, and does general 'dozing and materials handling.

"Our D7 is doing a fine job all over the plant. We bought it to use as a workhorse, and that's just what it is. It's given us no trouble at all," says George French, Jr., owner.

Much of this 'dozer's efficiency is due to its scientifically curved moldboard. Loads are *rolled*, not pushed, so you can handle bigger loads, even in "dead" materials, at higher speeds. The blade is heavily braced, with a cutting edge of high carbon steel that stands up against equipment-busting rock.

Blade capacity is carefully matched to the power of the Cat* D7 Tractor. This husky yellow unit delivers an *honest* 81 HP *at the drawbar*. Its tracks are full-oscillating for maximum traction, and "Hi-Electro" hardened for long wear. Effective filters and seals protect the factory-built precision of the D7 even in severe dust.

Tracy Rock and Gravel Co. is sold on Caterpillar performance. The plant, which has served local farmers and contractors since 1943, is all-Caterpillar equipped. Three Cat D13000 Diesels run the slurry plant and two draglines.

Why not find out for yourself what this husky yellow equipment can do? Your nearby Caterpillar Dealer—who backs his sales with fast service and genuine factory parts—will arrange a demonstration of the tractor-bulldozer combination that fits your *needs*. Call him now.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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Report on Current Labor Developments

By S. HERBERT UNTERBERGER
S. Herbert Unterberger and Company
Industrial and Labor Economists
Washington, D. C. — Philadelphia, Pa.

Pattern Settlements

IN the years after World War II it became commonplace to talk about "rounds of wage increases", as if all or most of the contract settlements resulted in the same or closely similar adjustments. The pacesetter for these rounds was generally the steel industry, which had a wage increase history that looked roughly like this:

1946—18½ cents per hour general increase
1947—15 cents per hour general increase
1948—13 cents per hour general increase
1949-50—Group insurance and pension plans
1950—16 cents per hour general increase
1951—No increase
1952—16 cents per hour general increase
1953—8½ cents per hour general increase

While these pattern settlements had a substantial influence on other collective bargaining, universal adoption of them was far more apparent than real. This may be seen from the following information, based on data provided by the Bureau of National Affairs, a private Washington research and reporting organization. It shows for each year since 1949 the proportion of wage settlements which provided no wage increases and the proportion which provided wage increases of various amounts.

The average wage increases given in each of these years calculated from these data are shown in the following table. The first column shows the average (*i.e.*, the median) increase for all the wage settlements including those in which no wage increase was given; the next column shows the average increase for all the wage settlements in which a wage increase was given.

Average General Wage Increases (Hourly)

Year	Including No Wage Increase Cases	Excluding No Wage Increase Cases
1949	6.1c	8.4c
1950	7.0c	8.1c
1951	8.9c	10.2c
1952	8.4c	8.9c
1953	8.2c	8.6c

It is clear from these two tables that many wage adjustments made in those years differed substantially from the steel industry's "pattern" settlements. Moreover, the average increases as well were quite different from those found in the steel industry. For example, in 1949, the pattern-making steel industry made no general wage increase but gave both group insurance and pension plans. Among the wage settlements made in industry generally that year, only 21 percent provided no wage increases; the other 79 percent gave wage adjustments of varying amounts. Only 4 percent of the other wage settlements provided pensions and 14 percent provided social insurance programs. The average overall wage adjustment was 6.7 cents an hour, while the average wage adjustment among those settlements which provided a wage increase was 8.4 cents.

The usual small or medium-sized company will find it useful to compare its wage increases not only with the so-called pattern-setters but also with the averages shown here. The results may be surprising.

As has been seen, the influence of pattern settlements was somewhat less than generally supposed, even before 1953. Beginning in 1953, with a return to more normal economic conditions, contract settlements became even less uniform. Instead of reflecting general trends in the economy, they were reflecting, increasingly, the special situations of the industry and company for which they were made. Thus, the Bureau of Labor Statistics reported as follows:

". . . General wage increases were widespread in most industries during the year. The wage increases which were put into effect in the major manufacturing settlements during 1953 typically ranged from 5 to 9 cents an hour.

"Most existing cost-of-living escalator clauses were continued and converted to the new Consumer Price Index during 1953. Many of these new or revised agreements incorporated a large proportion of previous cost-of-living increases into base rates, thus reducing the extent to which future price reductions could result in automatic wage rate decreases. A number of major settlements raised 'annual improvement factor' increases due in 1953 and subsequent years—generally from 4 to 5 cents an hour. . . .

"The automobile settlements, as well as collective agreements in a number of other industries, offset in part previous narrowing of percentage differentials in pay among occupations by giving extra increases to skilled workers. . . .

"Most of the 1953 settlements liberalized one or more supplementary wage benefits in addition to increasing wage rates. There was a wide variation in the package of benefit changes. Among the most common changes were increased shift differentials, guarantee of pay for holidays occurring on Saturdays, liberalization of vacation provisions for workers

(*Continued on page* 108.)

Wage Settlements

	1949[1]	1950[2]	1951[3]	1952[4]	1953[5]
No wage increase	21%	13%	1%	7%	7%
Wage increase					
1 — 3 cents	4%	6%	5%	6%	5%
4 — 6 cents	28%	31%	21%	28%	28%
7 — 9 cents	16%	17%	21%	20%	25%
10 — 12 cents	16%	23%	33%	22%	20%
13 — 15 cents	7%	5%	11%	8%	7%
over 15 cents	8%	5%	8%	9%	8%

[1]Pensions figured in 4% and social insurance programs figured in 14% of the settlements.
[2]Pensions figured in 8% and social insurance programs figured in 24% of the settlements.
[3]Pensions figured in 6% and social insurance programs figured in 15% of the settlements.
[4]Pensions figured in 6% and social insurance programs figured in 22% of the settlements.
[5]Pensions figured in 6% and social insurance programs figured in 24% of the settlements.
Source: Bureau of National Affairs, Washington, D. C.

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If, like Hamilton, service and profits are your concern, you can't afford not to own a Mack!

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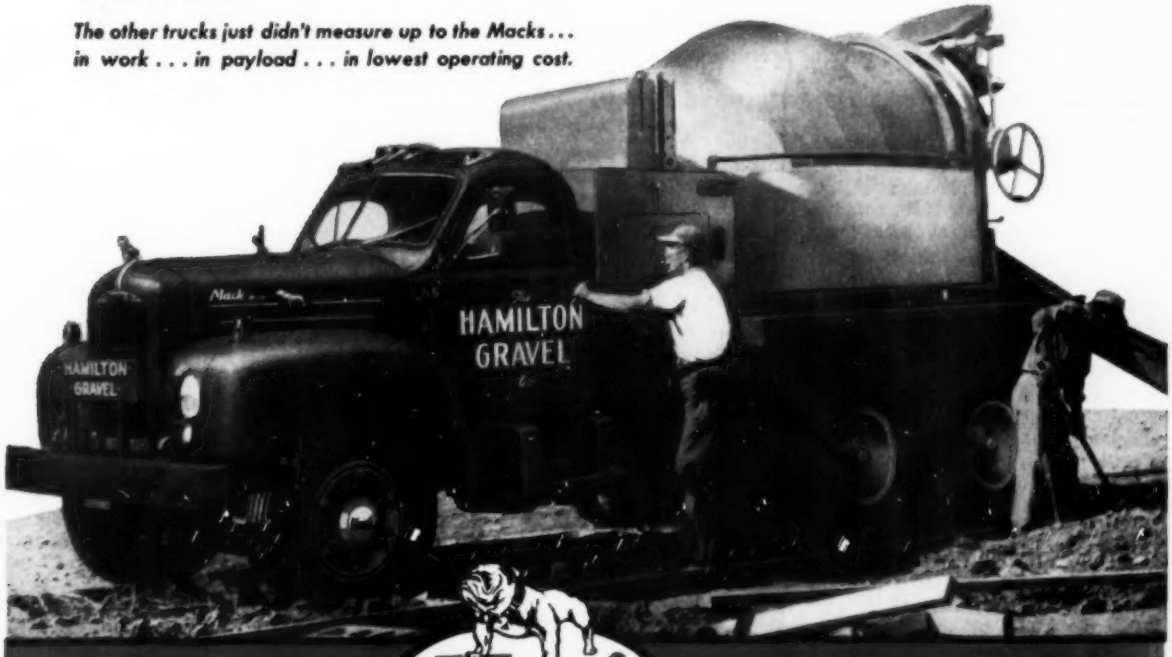

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roadways made easy

PHOTO COURTESY HETHERINGTON AND BERNER INC., INDIANAPOLIS, INDIANA

Chrysler *Power helps keep America rolling . . . at less cost*

This mobile mixer-paver replaces costly man-hours with economical horsepower. In one continuous operation the unit takes in sand, gravel, stone or other road surfacing materials, mixes them in with a binder ingredient—all in predetermined proportions—and spreads the mixture onto the roadbed, to whatever depth best meets grade and crown requirements. Materials to be mixed may be fed to the unit from trucks, as in this case, or picked up from windrows with a loader attachment. The entire operation requires the services of three, possibly four, men.

The Hetherington and Berner Moto-Paver turns out up to 120 tons of mix per hour for resurfacing jobs. Paving width is adjustable from 8½ to 12 feet, depths to 7 inches. Paving speeds start at two feet per minute. Road speeds up to twenty-five miles per hour enable the equipment to carry itself from one job to another.

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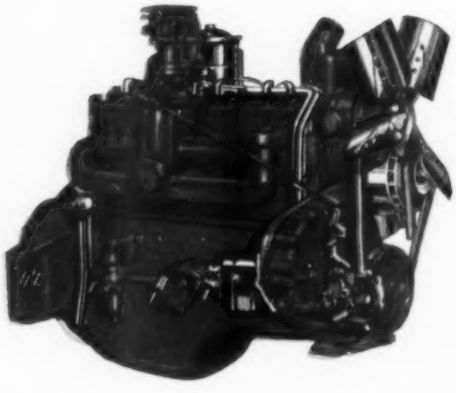
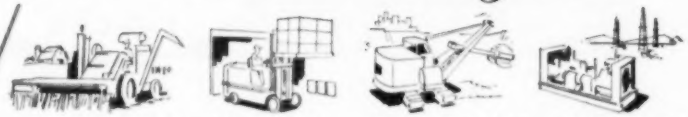
Remember, too, that Chrysler Power is not expensive. Production-line methods adapted to specialized industrial engine building provide a custom-built engine at mass-production prices. If you prefer, write: ***Department 136 Industrial Engine Division, Trenton, Michigan.***



CHRYSLER *Industrial Engines*

HORSEPOWER WITH A PEDIGREE



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View shows two of several 7' Symons Super Heavy Duty Short Head Cone Crushers installed in the Lake Superior region.

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*Actual unretouched photos taken before and after installation of a Johnson-March system at a large Eastern Rock Crushing Plant.

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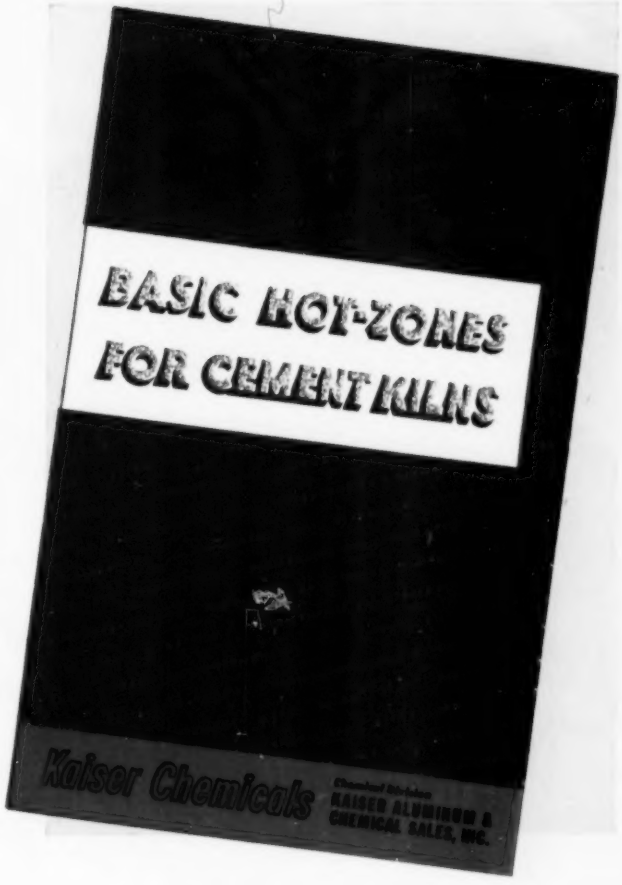

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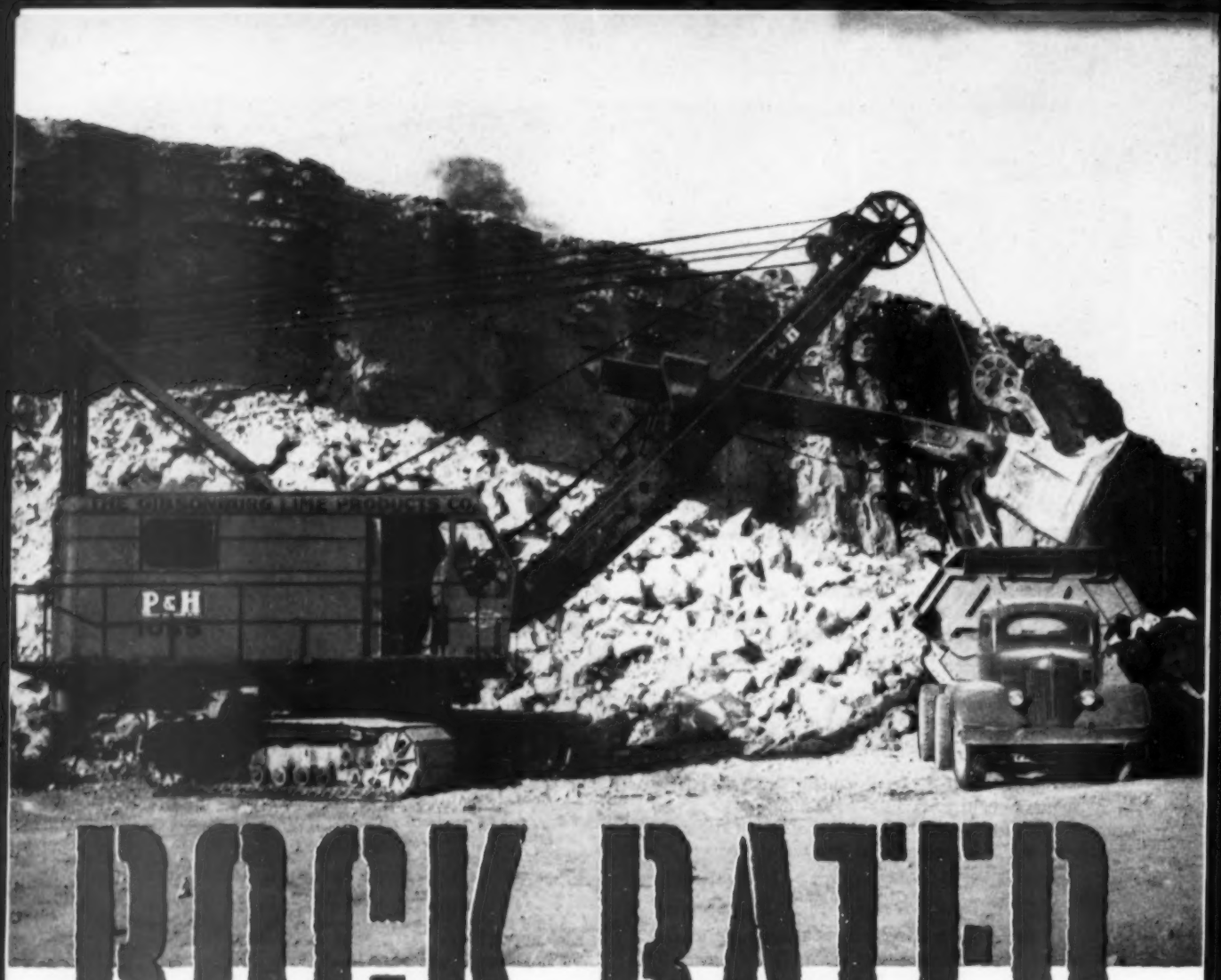

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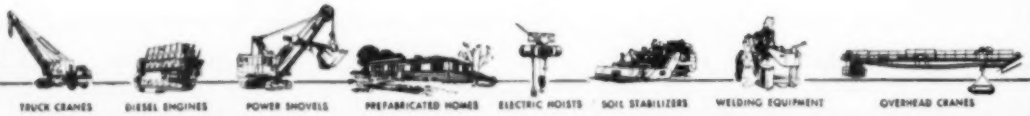

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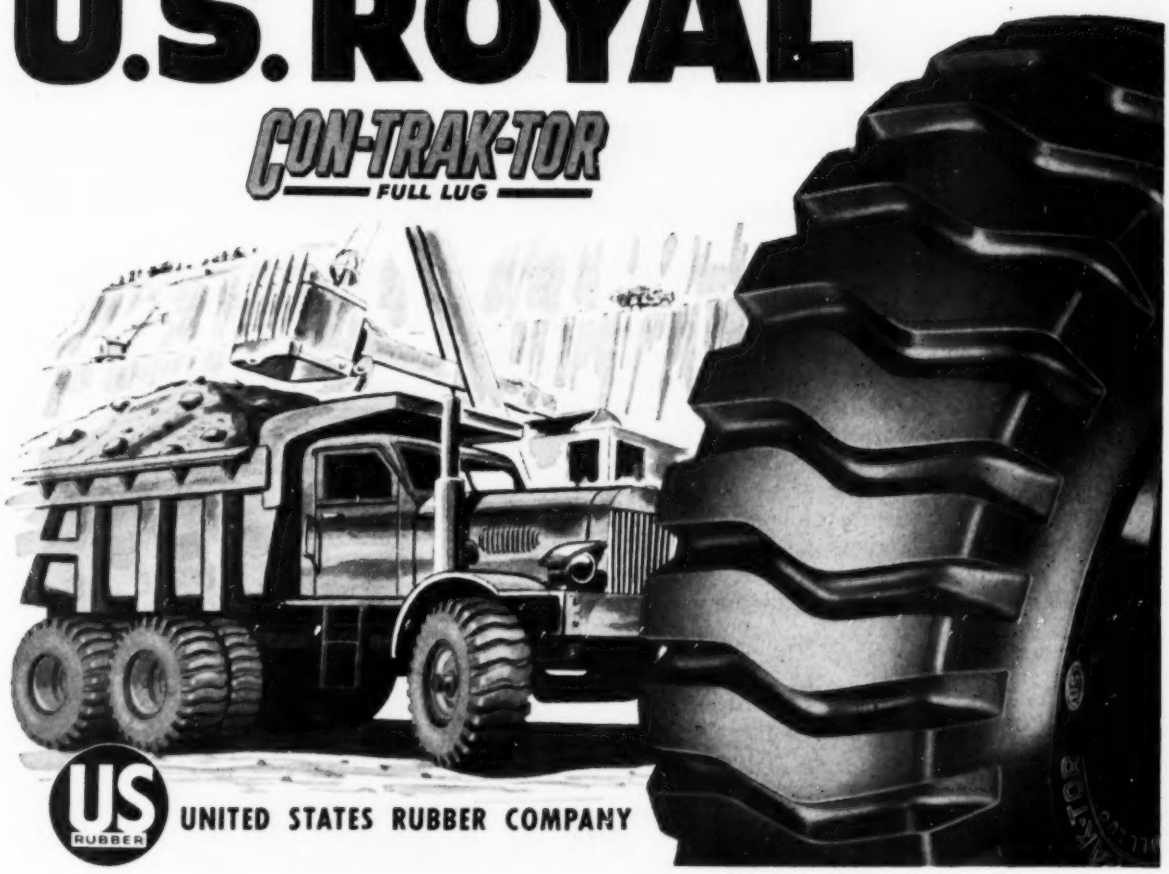

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ALLIS-CHALMERS

Dillon Stone Company Operates Two Quarries With New 250-T. P. H. Portable Plant

another ON THE SPOT report

By KENNETH A. GUTSCHICK

IN June, 1953, the Dillon Stone Company, Columbus Junction, Iowa, placed in operation a new, high-production portable crushing and screening plant which serves the firm's two limestone quarries; the main quarry (which is also the site of the firm's office and shop) is located 5 miles southwest of Columbus Junction, and the other 12 miles south of the town.

Prior to the purchase of the new portable plant the firm had operated a permanent crushed stone plant at its main quarry site. This plant, which is now on standby status, was described in detail in an earlier issue of PIT AND QUARRY.* Although the permanent plant was an efficient production unit, the company decided to change over to a portable setup in order to effect the most economical operation of its two quarries. Thus the new plant is readily moved about to each operation and set up on the quarry floor in close proximity to the quarry face, thereby permitting direct loading. The changeover also effected a savings in manpower and truck haulage expenses, the latter through almost complete elimination of haulage out of the quarry.

The portable plant, specially built for the Dillon firm by the Iowa Manufacturing Company, consists of three separate rubber-tired portable units —one a Cedarapids 3042 double-impeller impact breaker coupled with a primary apron feeder, the second a Cedarapids 4033 hammermill which is operated in closed circuit with a 4- by 12-ft. double-deck screen, and the third a Cedarapids secondary screening unit having another 4- by 12-ft. double-deck screen.

The first two units have tandem rear axles and a single front axle, while the third unit has two single axles. Double tires (10:00 x 20, 12-ply) are used throughout.

The plant produces at a rate of about 250 t.p.h., 25 percent of which is agricultural limestone. Total annual production approximates 150,000 tons.

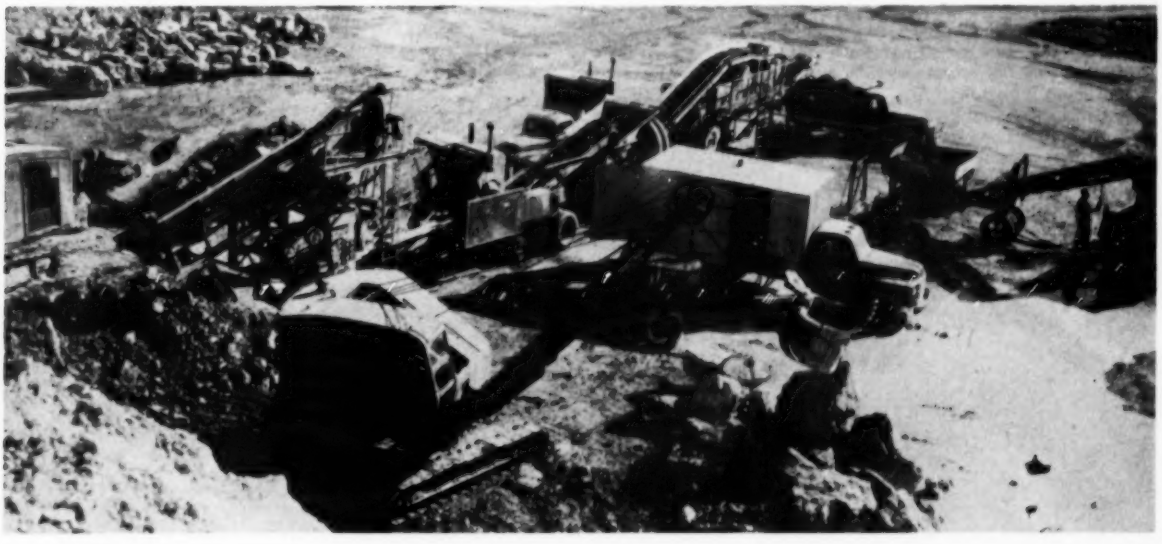
The portable plant features the use of a diesel-electric generating set which supplies power for the entire plant, with the exception of the two crushers; these are driven by separate diesel engines. Another notable feature of the plant is the use of motorized head pulleys on all of the belt conveyors. In addition, the plant offers considerable flexibility, producing up to four sizes of crushed stone when both screening units are in service.

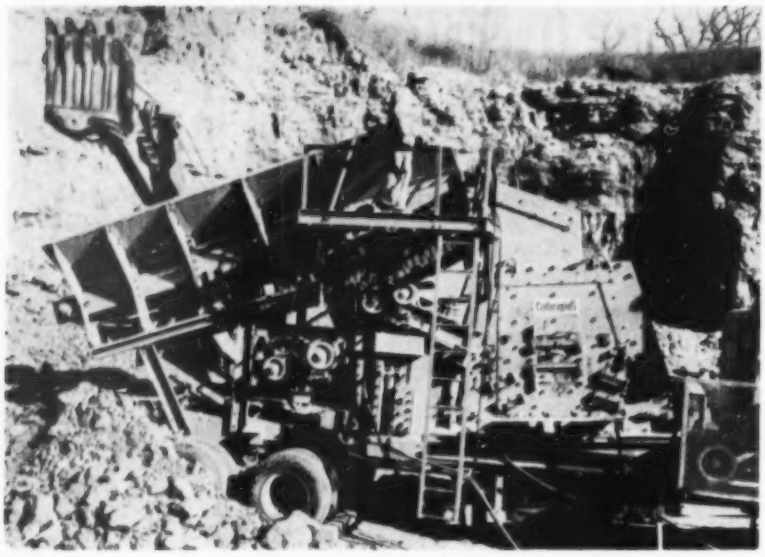
John L. Dillon (left), superintendent, and William D. Dillon, company owner and president.

The main quarry, which covers about 7 acres, has a depth of about 67 ft., with an overburden of about 20 ft. Part of the quarry is being operated as a single face, and the other part in two benches, including a top 32-ft. section and a lower 35-ft. zone. The upper bench consists of a relatively soft, brown-colored dolomitic limestone, which makes an excellent agstone due to its high magnesium carbonate content. At first the farmers in the area were somewhat hesitant about using this brownish material, but this prejudice

*Heard, L. T., *Fast, Uniform Limestone Production Achieved With Single Crusher Setup*, PIT AND QUARRY, Vol. 44, No. 3, September, 1951, p. 78.

A general view of the new portable 250-t.p.h. crushing and screening plant of the Dillon Stone Company, Columbus Junction, Iowa. Two ¾-cu. yd. shovels feed quarry-run stone to the plant. The enclosed truck houses the diesel-generating unit which supplies power for plant operation.





A view of the primary crushing station, showing the 3- by 14-ft. apron feeder and double-impeller impact breaker. Note the tandem axle and the use of double tires.

has been largely overcome by an advertising campaign undertaken by the company which stressed the real value of the material. The lower bench is a harder gray limestone, averaging over 90 percent $CaCO_3$; it is suitable for agstone as well as a road stone and bituminous aggregates. The entire limestone deposit is a part of the Burlington formation (Mississippian age).

Primary blast holes, 6 in. in diameter, are drilled with a gasoline-powered crawler type Keystone Model 51 well drill; a 12- by 17-ft. spacing pattern is generally used. The holes are loaded with Du Pont Nitramon (5-in. cartridges) and Nitramix (5½-in. cartridges), the Nitramix being used in the lower portion of each blast hole. The explosives are detonated with Primacord and delay caps. Secondary breakage is effected through use of a drop ball operated from the boom of one of the quarry shovels; boulder shooting is avoided in order to prevent possible damage to the portable plant from flying debris.

Quarry digging and loading is handled by two diesel-powered ¾-cu. yd. shovels—one a Bucyrus-Erie 22B powered by a Caterpillar 318 engine and the other a Kochring 304 powered by an International UD 16 engine. The two shovels alternate in charging the primary feed hopper of the first portable unit. An Allis-Chalmers HD-5 tractor-dozer is used for cleanup around the shovels.

The primary crusher is a 3042 double-impeller impact breaker driven by a Murphy Model 122 diesel engine through V-belts. The feed to the crusher is *via* a 3- by 14-ft. apron feeder discharging over a 30-in. by 4-ft. vibrating grizzly which has 2-in. openings. A 20-hp. electric motor is used to drive both the feeder and grizzly. Crusher product is then conveyed on a 30-in. by 30-ft. belt conveyor to a small hopper, mounted over a reciprocating feeder, and then on a 30-in. by 28-ft. belt conveyor to the 4- by 12-ft. double-deck screen of the second portable unit.

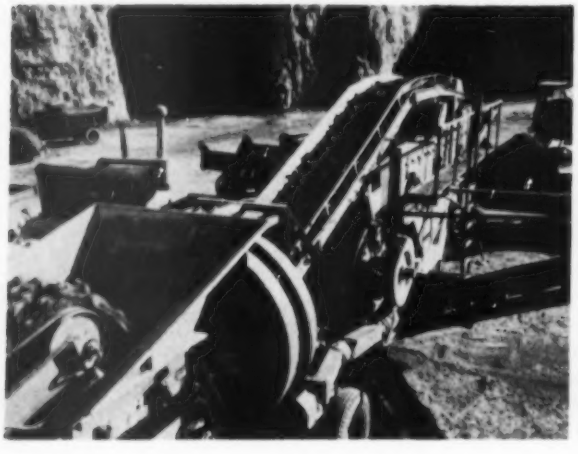
Oversize off the top deck is fed to a 4033 hammermill, which is operated in closed circuit with the screen. The return to the screen is effected by a 30-in. by 10-ft. under-crusher conveyor and a 75- by 22-in. elevating wheel which discharges to the screen feeder belt. The hammermill, like the primary crusher, is driven by a Murphy Model 122 diesel engine; however, this engine is mounted on a flatbed truck, the power being transmitted through a gear reducer and universal joint coupling. (The engine drive for the impact breaker is mounted right on the portable unit.)

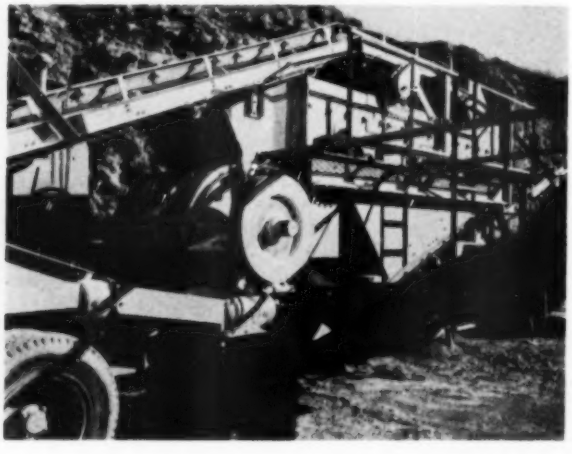
Stone passing through the two decks of the primary screen represents finished product, that is, when the secondary screening plant is not placed in service. Generally agricultural limestone is made from the bottom deck; the screen openings used varies from 3/16-in. when the stone is wet to smaller sizes when the stone is dry. The top deck varies from ¾-in. to 3-in., depending upon the stone size desired.

Finished product through each deck is delivered to waiting trucks *via* a short belt conveyor—a 30-in.

Left: Looking down the plant at the 30-in. conveyors transferring material from the primary crusher to the 4- by 12-ft. double-deck screen. The Dillon plant features the use of motorized head pulleys on the conveyors. Note the elevator wheel (foreground).

Right: Secondary crushing is accomplished in the hammermill shown on the left, which is operated in closed circuit with the primary screen (right).





belt handling the agstone and a 24-in. belt the stone. The Dillon firm also utilizes Cedarapids 5-cu. yd. portable bins, which are fitted with a 30-in. by 19-ft. delivery conveyor for truck loading (see photo); this partially eliminates the need for shutting down the plant momentarily until a delivery truck or stockpiling unit arrives on the scene. One of the unusual features of the portable plant concerns the truck loading conveyors, which are operated by individual pushbutton starters attached to electric cords; this setup considerably facilitates loading.

When three or four sizes of stone are required simultaneously, the portable secondary screening unit is put in service; it consists of a Cedarapids 4- by 12-ft. double-deck screen and auxiliary conveyors. The feed conveyor is the 30-in. by 27-ft. unit; the others are 30 in. by 14 ft., 24 in. by 14 ft., and 24 in. by 11 ft.

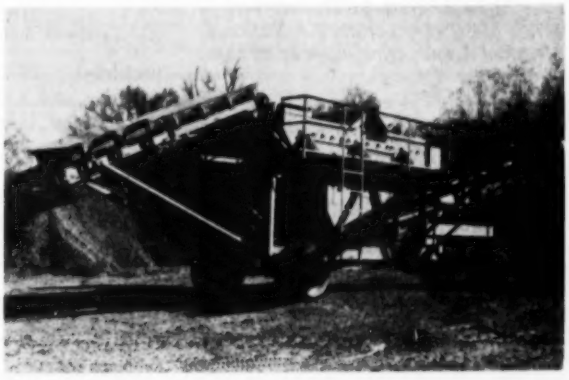
Electric power for the operation of the entire plant, with the exception of the two crushers, is supplied by a truck-mounted diesel-electric generator, consisting of a Murphy Model 22 diesel engine and a 125 kw. generator producing 440 v. The unit is enclosed on the rear of a Ford truck. The operation of the three units of the portable plant is controlled from a master panel with Cutler-Hammer controls, located at the primary crusher. However, each portable unit, as well as the delivery conveyors, has its own pushbutton control. By means of the extensive electrical controls, manpower requirements are kept to the minimum.

Another feature of the plant concerns the use of Shrock motorized head pulleys on all of the conveyors; these involve the enclosing of the electric motor, reduction gear, and other moving parts inside the drum of the head pulley. This design protects the drive parts from dust and weather and thus reduces conveyor trouble and down time. The conveyors are driven by 3-, 5-, and 7½-hp. motors.

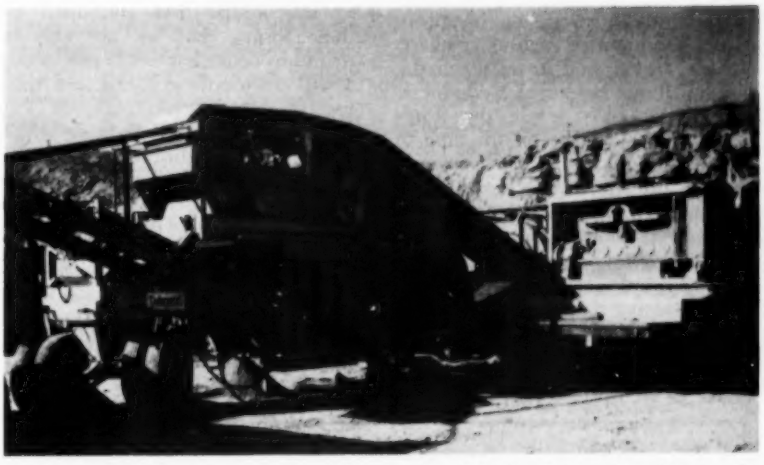
Stockpiling is handled by three Koehring W60 Dumptors, while a Hough HM Payloader and a Haiss loader are used for truck loading from stockpile. The Hough unit, as well as the Allis-Chalmers tractor, is used to move the portable plant about on the quarry floor.

The Dillon Stone Company is owned by William D. Dillon, who serves as president and treasurer. John L. Dillon, a brother, is the general superintendent. Formerly (from 1944-1950) the quarry was operated as a partnership under the name Dillon, Sharpe, & Company.

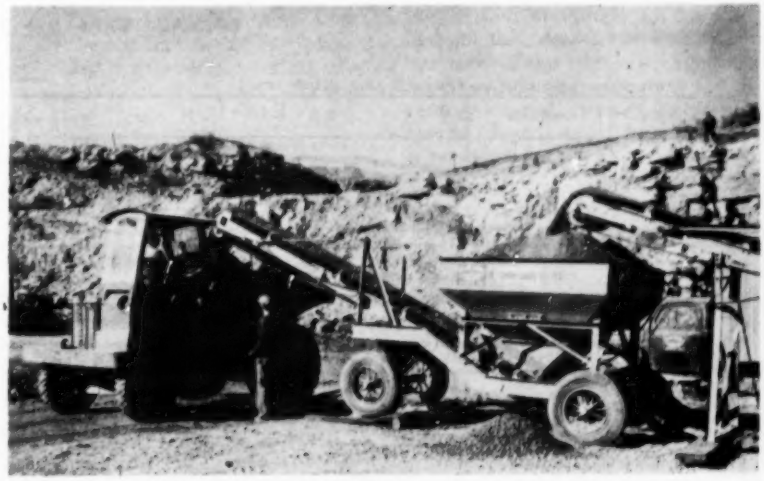
This concern is an active member both of the N.A.L.I. and the Iowa Agricultural Limestone Association. W. D. Dillon acts as a director of the N.A.L.I., and he was instrumental in the formation of the Iowa association. To promote the use of agricultural limestone in its area, the company makes excellent use of billboard advertising and direct mail. For the latter, the company uses N.A.L.I. circulars as well as its own.



A view of the secondary screening plant, which was not being operated during the writer's visit. The screen is a 4- by 12-ft. double-deck unit, and when coupled with the primary screen it can produce four stone sizes.



Another view of the primary screen and hammermill. Note the diesel engine drive for the hammermill. All other plant equipment except the primary crusher is electrically-driven.



An optional method of loading trucks or stockpiling units involves the use of a 5-cu. yd. portable hopper. The man standing in the picture is operating the belt conveyor by means of pushbutton control. The conveyors are driven by motorized head pulleys.

Warehousing Problems Dealing with Inventory and Control of Stocks

(This article is adapted from an illustrated address presented recently by Mr. Perry before the National Crushed Stone Association at its convention in Chicago.)

By H. D. PERRY
Vice-President
Southwest Stone Co., Dallas, Tex.

THE prime requisite for any plan of control of stocks is a full and complete inventory of all materials, combining the items of like classifications of all plants. Our old method was to take an inventory at the end of the year, covering all items in stock at that time. We have now adopted the system of periodic inventory taken at scheduled times throughout the year. During our known slow months of production we schedule sections of inventory in definite months, such as crushers, shovels, trucks, and so on down the line, until our inventory is complete. During our busy season the storekeeper can give most of his time to issuing material for operation and to replenishing low stock.

Although the general subject of my talk is *Warehousing Problems Dealing with Inventory and Control of Stocks*, we appreciate that each company has its own particular problems, with which we are not familiar and I shall explain to you the method in which our company is trying to solve these problems.

It had been our opinion that the purchasing department had too little information on the whys and wherefores of the materials purchased and where such materials were used. To correct this fault, we started an intensive study of the forms we used in purchasing and warehousing. We redesigned our old forms and developed new ones. It is on the basis of the information contained on these forms, that we are able to maintain better control of our stocks. I will discuss these forms and their uses in our system . . .

Figure 1 shows the form on which material is requisitioned by our plants. These are approved at the plants by the superintendent. In the first columns you will note the usual headings as found on a great many forms used today. But in the second group of columns we have listed "On Hand", which means the quantity of this item in stock at the time of requisition; the next two columns "Purchased Last Year" and "Purchased This Year" are just what the titles imply—the quantity of this item purchased in the designated period. The column "Date Wanted" gives the purchasing department a better idea of the urgency of the need for this material. The information contained on this form gives us the opportunity to adjust our buying to the quantities needed to maintain sufficient stocks and also to obtain advantageous discounts.

When the requisition is received in our general office, it is passed to our assistant purchasing agent, who checks it against his records, and at the same time determines whether any items are available at any of our other plants. Based on this information, purchase is approved or disapproved by our president.

Figure 2 depicts the card record (kept in our office) of all purchases made. At the top of this card is a place for the item and its part number, followed by a more detailed description, its weight, and the increment in which it is bought. Immediately below are listed the vendors handling this item. In the next column is the interchange part that can be used in lieu of the original item, if any. The next two columns, "Transportation" and "Used On" tell us the best method of transpor-

Fig. 1. This 8½- by 11-in. form is a requisition blank for materials which must be approved by the superintendent.

FORM 123

SOUTHWEST STONE COMPANY
1603 MERCANTILE BANK BUILDING
DALLAS, TEXAS

REQUISITION NO. _____ PLANT NO. _____

REQUISITION FOR MATERIALS AND SUPPLIES _____ 19____

ITEM NO.	QUANTITY	PART NO	DESCRIPTION	ON HAND	PURCHASED LAST YEAR	PURCHASED THIS YEAR	DATE WANTED	ORDER NO.

INSTRUCTIONS: SHOW APPROXIMATE WEIGHT OF ARTICLES ORDERED AND HOW SAME SHOULD BE SHIPPED—FREIGHT, EXPRESS, PARCEL POST, TRUCK LINE.

DESCRIBE ARTICLES WANTED CLEARLY, AND GIVE CATALOGUE REFERENCE WHEN POSSIBLE.

WHEN POSSIBLE SHOW FROM WHOM LAST PURCHASE MADE AND APPROXIMATE DATE.

WHEN ORDERING PARTS FOR A MACHINE, GIVE NAME, DESCRIPTION AND NUMBERS OF PARTS WANTED. ALSO SHOW NAME OF MAKER, STYLE OR TYPE OF MACHINE AND COMPLETE DESCRIPTION, INCLUDING SHOP NUMBER.

REQUISITION NO. _____ _____
SUPERINTENDENT

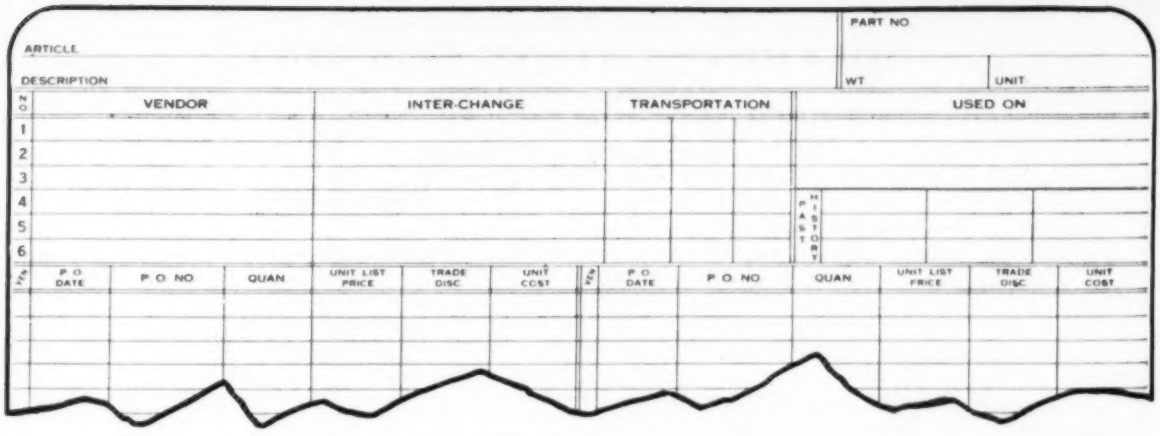


Fig. 2. A sample from the 8- by 5-in. card record kept of all purchases made.

tation and its cost, and on what equipment the part may be used.

Possibly one of the most important features shown on the card is the past history of use of this part. In this group are shown the quantities used at the various plants during the last three years; this information gives us the opportunity to adjust our buying to larger quantities if a favorable discount is indicated.

The lower part of the card gives us information as to the vendor, the purchase order number, and the quantity bought. The next three columns show the list price, the discount, and the net price. On the back of this card (Figure 3), we keep our record of the quantity of this item now in stock at all plants, using red figures to show material received and blue figures to show material checked out. The balance column shows the balance of total stock at all plants, since we combine all like materials on this card for all plants. Pertinent information from this card is entered on our requisition, which is then passed on for purchasing.

When it has been determined from whom the material is to be purchased, we issue our purchase order, which is shown in Figure 4. The upper section of this form has space provided for the vendor, our purchase order, the requisition number, the destination, the terms, the f.o.b. point, and the method of shipment. The remainder of this form is used to describe material being bought, showing list price and discount.

Figure 5 is the auditing copy of this form, used in checking the invoices received against the order, for price quoted and price billed. A copy of our receiving report, the invoice, and the freight bill are attached to this copy, and it becomes a part of our permanent files. Upon completion of the order, this form is filed in a vendors' file. The lower part of this form is used for information in tracing shipments.

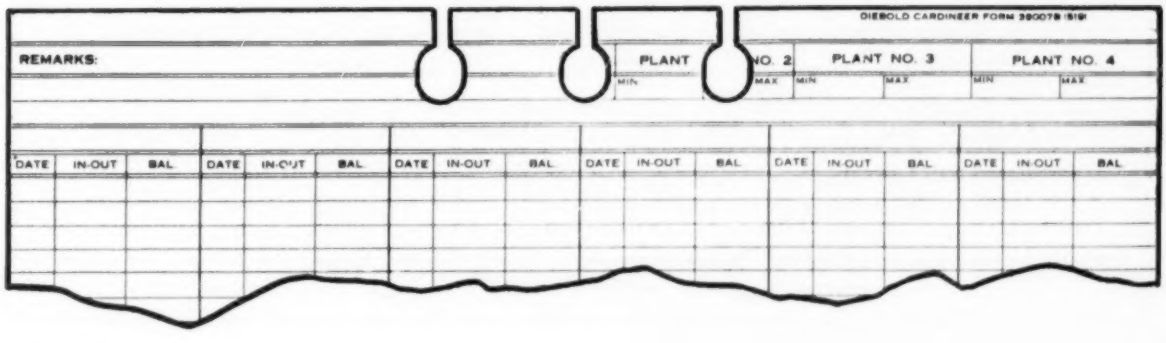
Figure 6 shows the office copy filed in numerical order for each plant.

Figure 7 shows the copy sent to the plant for its records; it is kept in a numerical file at that particular plant. There is an additional copy of the order for use at the plant; and when material is received, the papers are attached to this copy, which is identical to the one shown in Figure 7, except for the color. An invoice form is printed on the back of this copy. (An identical invoice form is also printed on the back of the auditing Figure 5.)

Our receiving report form, shown in Figure 8, is a four-part form, consecutively numbered, the prefix number designating the plant at which the material is received. The original, shown here, and the fourth copy are sent to the general office, while the second and third copies remain at the plants. Shown on this form is the date of receipt, the order number, the methods of shipment, the waybill number if by rail or motor freight, the weight, if known, and the charges, whether prepaid or collect.

Please note the following two lines, indicating the shipper and the vendor. These are important because shipments are often received from original equipment manufacturers, although the order may have been placed with their local agent. The information contained in the main body of this form is checked against our copy of the purchase order; the final two columns are used for inventory control and cost accounting. In the lower part of the form space is provided for showing shortages or damages to material and for remarks.

Fig. 3. The reverse side of the card in Fig. 2 is used for recording the quantity of the item in stock at all plants.



SOUTHWEST STONE COMPANY

GENERAL OFFICES
1608 MERCANTILE BANK BUILDING

DALLAS 1, TEXAS

PURCHASE ORDER NO.

REQUISITION NO.

PLEASE FURNISH AND SHIP THE FOLLOWING DESCRIBED MATERIAL, SUBJECT TO THE CONDITIONS SHOWN BELOW

SHIP TO SOUTHWEST STONE COMPANY, AT
MARK EACH PACKAGE FOR PLANT NO.

TERMS: F. O. B. VIA

ITEM	QUANTITY	ARTICLES AND DESCRIPTION	UNIT PRICE	DSCT.

ATTACHED ACKNOWLEDGMENT MUST BE RETURNED PROMPTLY SHOWING DEFINITE SHIPPING DATE

SOUTHWEST STONE COMPANY

THIS ORDER IS PROMISED—DATE

NOTE: It is understood that, in accepting this order, you (the seller) agree not only to the terms and conditions set forth on the face hereof, but also to the conditions printed on the reverse side hereof which are hereby made a part of this order.

BY
PURCHASING AGENT

FORM NO. 121

ORIGINAL

Fig. 4. On the purchase order, an 8½- by 11½-in. form, space is provided for the vendor's name, the company's purchase order and requisition number, the destination, the terms, the f.o.b. point, and the method of shipment.

After the material is shown received and placed in the warehouse in its proper place, the entry is recorded on our cardform as shown in Figure 9. This card has spaces provided to show all necessary information as to the requisition and purchase order numbers, quantities ordered and received, and the amount of material on back order, if it has not been shipped complete. Both sides of the card have spaces for entering material received or checked out and for the balance on hand.

Fig. 5. This is the (pink) auditing copy of the purchase order, used in checking invoices received against the order for price quoted and price billed.

Figure 10 shows the form used in distribution of material. The original of this form is sent to our general office for entry on our card records, the duplicate copy being used for plant entry. Spaces have been provided to show to whom the material is to be delivered (the foreman or person in charge of the work), and also on what particular piece of equipment it is to be used. At the time the material is taken

ACKNOWLEDGMENT DATE THEIR ORDER NO. SHIPPING PROMISE

FORM	FOLLOW UP			ANSWER		
C-CARD	FORM	DATE	INFORMATION	FORM	DATE	INFORMATION
L-LETTER						
W-WIRE						
T-PHONE						

FORM NO. 121

AUDITING COPY

ATTACHED ACKNOWLEDGMENT MUST BE RETURNED PROMPTLY SHOWING DEFINITE SHIPPING DATE

SOUTHWEST STONE COMPANY

THIS ORDER IS PROMISED—DATE_____

NOTE: It is understood that, in accepting this order, you (the seller) agree not only to the terms and conditions set forth on the face hereof, but also to the conditions printed on the reverse side hereof which are hereby made a part of this order.

BY_____
PURCHASING AGENT

FORM NO. 121

OFFICE COPY - NUMERICAL

Above: Fig. 6. This office copy of the purchase order is filed in numerical order for each plant.

Below: Fig. 7. A plant copy of the purchase order is sent to each plant for its records and is kept in a numerical file. There is an additional (green) copy, identical to the plant copy except that it has an invoice form on the reverse side, for plant use.

REMARKS: NOTE CONDITION OF SHIPMENT BELOW

ITEM	DATE	AMOUNT	BAL.

FORM NO. 121

PLANT COPY - NUMERICAL

PURCHASING DEPT. COPY

SOUTHWEST STONE CO.

RECEIVING REPORT
(Inspection)

PLANT #3 — STRINGTOWN, OKLAHOMA No. 3 2704

Date Received	Purchase Order No.	Received Via	Way Bill No.	Weight Lbs.	Prepaid	Collect Charges $

Received From Address (Shipping point)

Purchased From Address

ITEM No.	QUANTITY	PART No.	DESCRIPTION	INV.	CHARGES
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					

ITEM	Over	Short	Damages

Remarks:

Rec'd By_____

Partial

Final

INVENTORY POSTED

Stock Clerk

Purchasing Dept.

THE GRAY REGISTER COMPANY, DAYTON, O.

Fig. 8. The 8½- by 5¾-in. receiving report is a four-color form made out in quadruplicate — for the purchasing department, the plant, the numerical file, and the plant office. The original (shown here) and the fourth copy are sent to the general office, while the second and third remain at the plant.

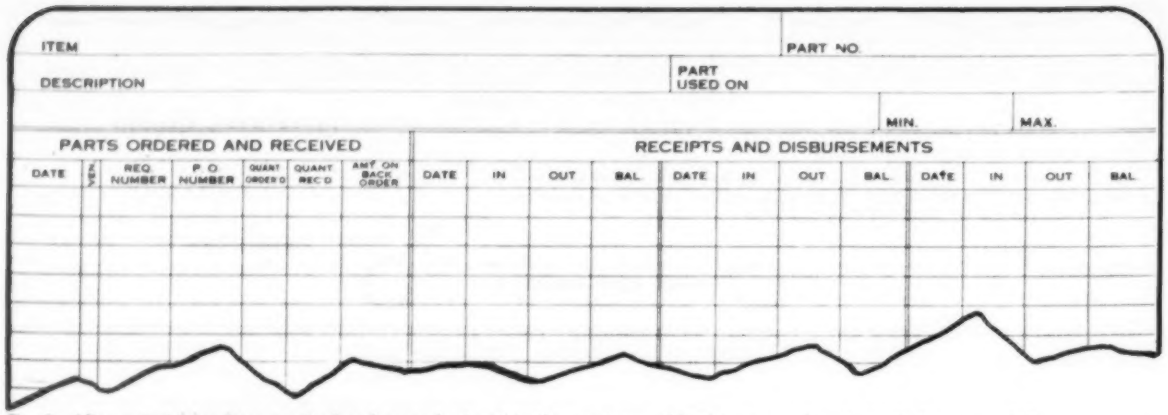


Fig. 9. After material has been received and properly stored in the warehouse, this information is entered on the 8- by 5-in. card shown above. Material received or checked out and the balance remaining are also recorded on this card.

SOUTHWEST STONE COMPANY
REQUEST FOR SUPPLIES No. 3- 7111

DATE _____ 195_

DELIVER TO _____ FOR USE ON _____

QUANTITY	PART NUMBER	DESCRIPTION	STOCK BAL

REC'D BY _____ STOREKEEPER _____

DALLAS OFFICE

Fig. 10. The form used in the distribution of material (7½ by 4 in. in size) is made out in duplicate, one copy for the general office and the carbon copy for the plant.

from stock, the storekeeper notes the approximate balance in stock, which he enters under stock balance. This will assist him in keeping a closer check on the material and also in ordering promptly, to keep his stock from being depleted. At the bottom of the form, space is provided for the signature of the person receiving the material for delivery to his foreman, and space for the signature of the person who has issued the material.

With the assistance of the plant superintendent, without whose co-operation this plan would be practically worthless, we have issued a list of authorized personnel who may order material from the warehouse. This procedure we have found most necessary, for if unauthorized personnel were allowed to check out material, our system would be worthless.

You might well wonder now about local purchases or emergency purchases. We realize that there will be times when material is not in stock at the warehouse, and such purchases must be made in order to avoid costly down time. We do not prohibit such purchases, but ask for co-operation and discretion on the part of the superintendent in limiting such purchases to emergency status.

We realize fully that the success of a system such as here outlined is dependent upon the co-operation of the superintendents, storekeepers, and the operators in the plants. In our organization we have been fortunate in having such co-operation. For us this system has worked.

Ralph Rogers Company Adds Indiana Distributing Plant

In order to expand its service and to increase its service to customers, Ralph Rogers Co., Inc., Bloomington, Ind., recently placed in operation a new rail-site distributing plant at Washington, Ind. The new facilities serve both the Mitchell Crushed Stone Company, Mitchell, Ind., and the Knox County Sand Company, Vincennes, Ind., both affiliates of Ralph Rogers.

The storage facilities there consist of three Heltzel two-compartment 200-ton bins, which are fed by a two-stage belt conveyor issuing from an undertrack hopper. Power for the operation of the belt conveyor and also for a car shaker is supplied by a Caterpillar diesel-electric generating set. The plant is equipped with a truck scale.

New Texas Firm to Explore Big Mexican Sulphur Mines

The signing of a contract by the Texas International Sulphur Company, Houston, with Central Minera, S. A., of Mexico City in December, won for the Texas concern the right to explore and develop all the Tehuantepec, Mex., sulphur-mining concessions granted to Central Minera by the Mexican government.

Texas International has begun construction of a sulphur plant, using the autoclave process, near San Felipe, Mex. Operations are scheduled to begin soon.

Victor Dykes is president of the Texas sulphur company, which was organized in 1953.

A new distribution center was opened in Washington, Ind., this spring by the Mitchell Crushed Stone Company, Inc., whose plant is near Mitchell, Ind.

July 13, 14, and 15 are the dates of the Western Plant Maintenance Show, to be held in the Pan Pacific Auditorium, Los Angeles. A plant maintenance conference, conducted by L. C. Morrow, will be held concurrently with the show.

Screen Maintenance Suggestions

By EMMETT GALLAWAY
Eastern Sales & Service Manager
Harristeel Products Company

another P.O. and exclusive

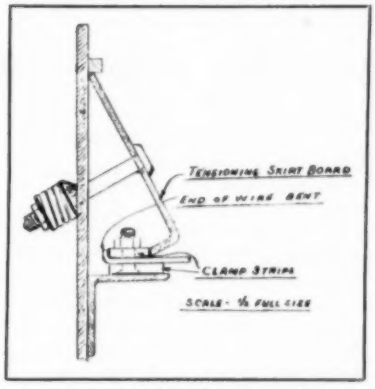
MOST of us, at one time or another, have encountered what appeared to be breakage in woven wire screen cloth. Frequently the failure is actually caused by abnormal wear rather than actual breakage. Anything which greatly reduces the cross-section area of the wires in woven wire cloth will cause failure. Sometimes the cause of failure is readily apparent; frequently it seems obscure. The following suggestions result from years of observation of many screens in many plants. The author makes no claims to originality of the solutions.

Screen cloth failure usually is caused by (a) abrasive wear, (b) excessive flexing or bending, or (c) chemical action or corrosion.

The last item (c) must be handled by special alloys and coatings, and fortunately is not common to most plants. Most screen cloth manufacturing companies can and will advise on the best screening media for each specific condition. It is with the first two items—(a) and (b)—that these notes are concerned.

Abrasive Wear Abrasive wear on the top surface of the screen cloth caused by contact with the material being screened is normal. On many screens there is also abrasive wear on the bottom of the cloth where it contacts the support bars. This is not normal and is very destructive of cloth, Bottom wear is usually caused by the absence of proper support for the cloth, either from lack of tension or weakened and distorted support bars and frames.

All screen cloth has a certain amount of elasticity and will stretch slightly. In mounting screen cloth, it is advisable to apply sufficient tension to overcome this slight elasticity. After a few hours of use the cloth should be re-tensioned; and it should be re-tensioned several times during the first few days of operation. Unless this is done, the cloth will lose contact with the supporting frames at the upper end of each stroke and will not only pound quite severely but will also slide back and forth along the supporting frames with each stroke. This trouble usually shows up as polished and/or eroded spots where the cloth contacts the supports. Excessive action of this type results in breakage or ripping along the supporting members. This type of failure can and does occur on screens that are new or in perfect mechanical condition. Frequently, after long usage, the screen frames themselves are distorted through weakness caused by abrasive wear.



When using field installed clamp strips, let the wire project ¼ in. to ⅜ in. beyond the strip. After the strip is securely clamped, bend the ends of the wires up or down so that they rest firmly against the outside edge of the clamp. Flat panels are obtainable with the ends of the wires bent up 90 deg. as illustrated. However, cloth with such edge preparation necessarily carries a shop charge for the bending.

Material has contacted the frames to such an extent that they no longer offer sufficient support for the screen cloth. No amount of tension will prevent movement and pounding between the screen cloth and the supports if the frames are distorted.

Practically all shaker-type screens that use tension-mounted screen cloth have a series of support bars under the cloth so placed that the cloth is crowned either at the center or (in the case of some screens) with two crowns located at approximately ¼ and ¾ points of cloth width, with a center hold-down clamp. The elevation of the center support bars over the side supports (in some screens the end supports) is such that the various supports roughly follow an arc.

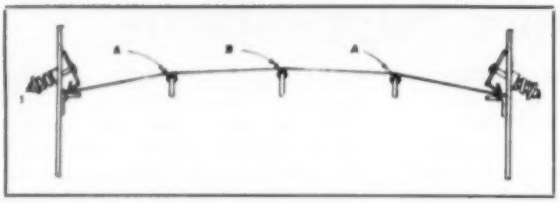
The various makes of screens have varying amounts of crown, and each manufacturer has selected the amount of crown best suited for the particular screen he makes. Usually we find approximately ¼-in. crown for each foot of width. Some screens do not have this much; others have much more. We should try to maintain, within close limits, the original crown as found on the new screen.

Unless there is sufficient crown, the slightest stretching at the end of the stroke will cause the cloth to lose contact with the supporting frames; as a result pounding and sliding occur. Since woven wire screen cloth has only a very slight amount of elasticity, it is almost impossible to crown it in two directions; hence it is essential that the crown be uniform from one end of the screen to the other. (From one side to the other on screens where cloth is tensioned at the ends.) This means that support bars must be straight. We have seen some screens where the heat of the material to be screened is so high that severe warping of support members occurred when rigidly-mounted bars were used. This necessitated using short sections of bars so mounted as to allow for expansion from heat without distortion.

Excessive Flexing Excessive flexing will break any metal, even one like annealed copper, if continued long enough. Failure from this cause is frequently blamed on brittle wire, and we can certainly agree that brittle wire would cause this trouble. However, when such trouble shows up on only one screen and does not occur on other screens using the same wire, we must assume that the fault is in the screen, and not in the wire.

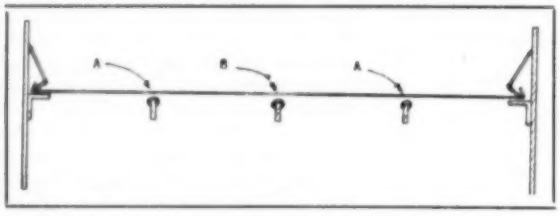
Almost all of the conditions mentioned in the discussion under item (a) will also lead to some flexing where cloth contacts support. The damage caused by flexing alone shows up as a clean break, with no apparent reduction of cross-section area. It also is frequently found combined with a moderate amount of abrasive wear, especially on the underside of the cloth where it contacts supports. We have seen several screens where, for convenience of chute placement, the cloth is extended beyond the screen frame without sufficient support. This invariably leads to breakage, although usually the breakage pattern is such that it does not appear to stem from the overhang. The solution, of course, is to install extended supports or to eliminate the unsupported cloth. Frequently, in moderate- to large-opening screen cloth constructed of fairly large wire, there is a tendency for the free wire ends to vibrate. This leads to inter-section wear and breakage from excessive flexing. A solution is to weld two rows of intersections at the ends of the cloth.

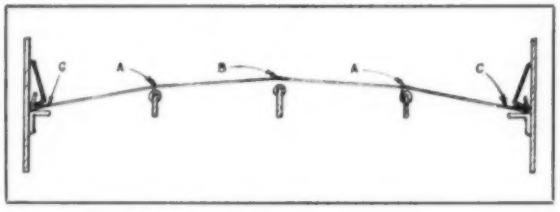
Another cause of flexing which leads to excessive cloth failure is attempting to use panels that are too great in overall width for the screen.



Left: Normal frame. Note that there is approximately ¾ in. clearance at sides; crown at B equals approximately 2/3 of B.

Below: Cloth too wide. It is impossible to draw cloth into firm contact with support bars A and B without side clearance. This condition results in severe breakage of cloth, much the same as loose tensioning bolts. Breakage usually develops at A, B, and C. In the failures described the cloth usually separates in a straight line parallel to the support bars.





Sagging frame. Cloth support bars no longer offer enough crown to prevent slapping at points A and B. This condition results in severe wear of cloth on the bottom side, where it contacts A and B. Failure at A and B with well tensioned cloth usually indicates this condition.

At all times there should be sufficient clearance for tensioning of screen cloth. This trouble can be eliminated by stating maximum overall width (outside to outside of hooked edges) when ordering screen cloth. The width inside to inside of the hooked edges will vary with the thickness of the wire and reinforcing, and can be compensated for by adjusting tensioning devices. The outside-to-outside dimension is determined by the clearance between the side frames of the screen and must remain constant, regardless of cloth or reinforcement thickness. Usually the panel width outside to outside should be from 1 to 1½ in. less than the inside-to-inside dimension of the screen side frames.

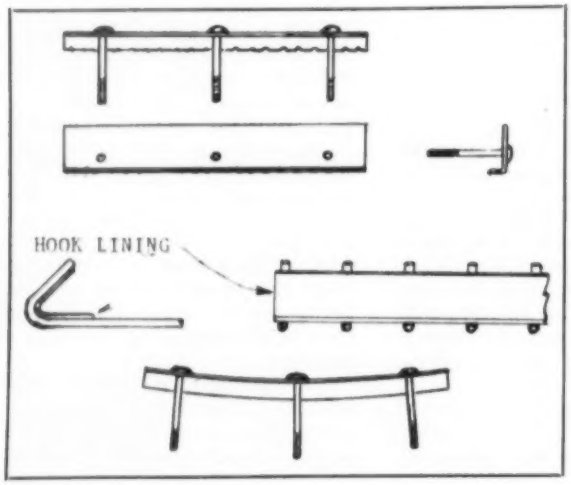
A frequent cause of cloth flexing, with consequent breakage, is the failure properly to seat the hooks or tensioning clamps that grip the cloth. When such devices are not well seated so as to apply pressure in the manner intended, they frequently cause the cloth to be bent at an acute angle adjacent to the tensioning device. This is usually a maintenance problem, but sometimes the type of edge preparation must be altered.

We have stressed proper tensioning and support of screen cloth as a must to reduce abrasion and flexing. Although we know that they cannot be eliminated entirely, we may take further steps to alleviate the destructive action. This we can do by placing rubber or other resilient material between the screen cloth and the supports to prevent metal-to-metal contact, thus reducing pounding and increasing the radius of the bending.

Running a screen without load will tend to cause cloth to whip, with consequent breakage due to flexing and abrading against supports. Overloading, in addition to reducing screening efficiency, will tend to cause excessive stretching of the cloth, which will result in flexing adjacent to the supports.

Another cause for excessive flexing with consequent cloth breakage, is excessive stroke or throw on the screen. Some screens tend to show excessive or erratic movement when the load is very light; others we have observed develop erratic throw patterns if the operating mechanism loosens slightly. Practically all screens depend more or less upon the damping action of the material being screened to keep the cloth movement within reasonable bounds. The stroboscopic light is the best way of observing the action of a screen. However, the fact that these lights are not available readily at all times has led many of us to resort to a chalk tracing on the side of the live screen frame for examination of stroke characteristics. All screen manufacturers will supply stroke pattern tracings for their particular screens. Any deviation from a standard pattern calls for corrective measures.

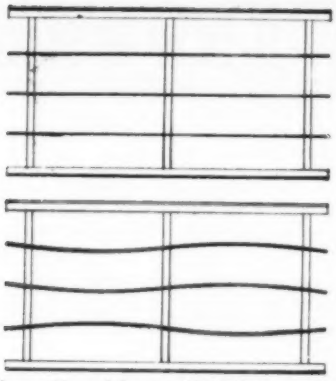
Sticky material which adheres to the wire cloth, in addition to blinding the openings, will increase the flexing and stretching of the wire cloth, thus causing breakage. When this condition prevails, we should investigate



Top: Worn tensioning member. Edge that contacts cloth is serrated by friction with hooks. This condition usually results in uneven tension on the separate hooks, with consequent breakage of those hooks which are subjected to extra tension. This can be prevented by lining the hooks with a light reinforcing angle which distributes the friction load evenly along the tensioning member.

Center: Close-up view of hook lining.

Bottom: Bent tensioning member. This condition results in uneven tension on the various sections of the cloth, with consequent breakage. Breakage usually does not follow any particular pattern, often occurring between supports where there is no wear on either the top or bottom of the cloth. Any condition of tensioning members or supporting members that results in uneven distribution of tension throughout the cloth will tend to cause excessive flexing of those parts of the cloth that are under light or no tension, and we may expect actual breakage to occur.



Above: Normal frame. All cloth supporting members are straight and parallel in the plan view. Only three support bars are shown; some screens have more, some less. We find that an uneven number of bars gives better screening efficiency and much better cloth support.

Below: Distorted frame. Warped or bent support bars can not offer uniform support and make it impossible to get equal tension in all parts of the cloth. Breakage of cloth under this condition is usually spotty and follows no regular pattern.

the use of special weaves, opening shapes, ball trays, and heated cloth to eliminate the condition. No general method can be prescribed to eliminate this condition, since its cause varies so widely from plant to plant and even from time to time. Most manufacturers can advise the proper procedure for eliminating blinding on their particular screens. Some screen cloth manufacturers have made a considerable study of this problem and will gladly suggest ways to overcome this difficulty.

Other Types of Problems

Another screening problem often encountered is plugging of the openings by hard particles of a size almost—but not quite—small enough to pass through the opening. Frequently a slight change in angle, speed, or stroke will eliminate the trouble. If these adjustments fail, we must resort to ball trays, special weaves, or other methods, as suggested by the manufacturer of the screen or screen cloth. Continued operation of a blinded or plugged screen cloth, in addition to reduced screening efficiency, leads to increased cost due to destruction of screen cloth, and, in many cases, damage to other components of the screen.

Frequently, in comparatively small-opening woven wire cloth, there are certain combinations of opening size and wire size that just will not give good service under all conditions, although under other almost identical conditions they work well. This condition can usually be identified by the sales engineer, who is thoroughly familiar with his particular screening media; and his suggestions as to the proper wire size for a given job of screening will usually prove practicable.

In general, screening is a series of compromises. We compromise between maximum service life and maximum screening efficiency when we select wire sizes. We compromise between maximum production and maximum adherence to specifications when we select opening sizes. However, we should not compromise when we lay out our maintenance program, since the difference in cost between shoddy maintenance and first-class maintenance of screens and screen cloth is too slight to warrant risking the destruction of a single panel of screening media, to say nothing of the expense of a shutdown for replacement of prematurely destroyed screen cloth.

The accompanying sketches are intended to point out some of the more common failures and their most common causes. They do not depict any particular make of screen; rather they depict features common to shaker-type screens of the tension-mounted cloth type in general.

P.C.A. Analysis Shows New Safety Records Set By Cement Manufacturers

A whole group of new cement industry safety records were set in 1953, according to Ivan F. LeGore, safety director of the Portland Cement Association in Chicago. Analysis of 1953 accident figures show that member companies of the P.C.A. reported the largest number of accident-free plants for the 38 years during which safety records have been kept for the cement industry. The accident frequency and injury severity rates among association members were the lowest noted in cement safety work.

The Portland Cement Association awards a safety trophy to member company plants operating a full calendar year without a lost-time accident. Of the 55 accident-free plants in 1953 (seven more than last year) 51 qualified for re-award of trophies won previously, one won a trophy for the first time, and three rated honorable mention. Prior to 1953 the highest number of accident-free plants was 54 in 1933 and 51 in 1948. A single disability in each of 26 plants spoiled their trophy chances for 1953. Ten portland cement plants operated without any chargeable injuries throughout the three-year period, 1951-1953.

The new all-time low-frequency rate of 3.81 accidents per 1,000,000 man-hours worked in 1953 was 18 percent below that of 1952 and 10 percent lower than the previous record rate of 4.22 set in 1951. The new record injury severity rate of 1.67 days lost and charged per 1,000 man-hours was 27 percent below the 1952 rate and 7 percent lower than the previous lowest rate, set in 1932.

Of 131 mining and quarrying operations, 100 were accident-free in 1953, compared with 95 perfectly safe in 1952. There were 78 with perfect records in both years. Quarrymen contributed markedly to safety progress by reducing their injury frequency and severity rates 40 percent.

The cement industry has often been named by the National Saftey Council one of the safest of the heavy industries.

A fellowship for graduate study in the fields of metallurgical, chemical, and sanitary engineering has been established by The Dorr Company, Engineers, Stamford, Conn. The award will commemorate the golden jubilee of the invention by Dr. John Van Nostrand Dorr of the Dorr classifier.

Lehigh Safety Committees Appointed at All Plants

A recent issue of the *Lehigh News Conveyor,* official publication of the Lehigh Portland Cement Company, lists the personnel of the 1954 plant safety committee at each of its 44 operations. The following were named chairmen of their committees:

Alsen, A. H. Uhler; Birmingham, P. E. Carlson; Buffalo, J. B. Zook; Bunnell, H. B. Burks; Fogelsville, Raymond A. Moritz; Fordwick, H. F. Shellenberger; Iola, R. E. Jones; Mason City, G. W. Hannaman; Metaline Falls, A. W. Schaeffer; Mitchell, C. E. Eichelberger; Oglesby, H. A. Zeliff; Ormrod, John T. Lynn; Sandt's Eddy, Alfred G. Metzger; and Union Bridge, Raymond Wilson.

Damage to the extent of $10,000 was caused recently at the Jacksonville, Fla., plant of the U. S. Gypsum Company after two explosions. The blasts were caused by short circuits in the high-voltage lines in the control room. A section of a wall was blown out, and three high-voltage transformers were damaged and set on fire.

WASHINGTON NEWS LETTER

another P and Q exclusive

MOST of the people in Washington who are concerned with the problems of "recession" are talking about a report issued recently by the Committee for Economic Development entitled *Defense Against Recession.*

The Committee for Economic Development describes itself as "a non-profit organization of 150 leading business men and educators who are devoting their time, experience, and resources to objective economic research and education. It is supported by voluntary contributions from business and industry and is non-partisan and non-political." It is generally regarded as representing the viewpoint of "progressive" business leaders. Its board of trustees includes chief executives of our largest corporations. Its recommendations are not only read with interest but are taken very seriously. This is true during the current Eisenhower business-oriented Administration; but it was equally true during the Truman Administration, whose Department of Commerce co-operated closely with CED in the preparation of a landmark study called *Markets After the Defense Expansion.*

When the business trend is downward, it has become customary to turn to the government, particularly the Federal Government, and demand that "something be done about it". In view of the uncertainty of the current business prospect, the Eisenhower Administration has been reluctant to take any strong measures. Essentially, it has been saying to businessmen that, thus far, the maintenance of economic stability is their problem—that it is not yet time for the government to step in.

This has left many businessmen bewildered about what they as individuals can and should do; and the Administration has not been of much help to them.

It is at this point that CED has made a series of useful suggestions. Under the heading, *What Business Can Do,* CED says, "The responsibility of the individual business to help achieve greater economic stability must be discharged within the framework of its other responsibilities for efficient production and distribution. This is a limitation, but it still leaves the individual business with an important part to play."

CED then proceeds to outline an eight-point program for individual businessmen to follow. It includes the following principles:

1. "Businesses should exploit fully the potentialities of research in the development of new products and improved production methods."

To achieve economic stability, the growth of demand must be stimulated by continuing and expanding research to develop new products and better methods. CED points particularly to housing as "an important case in which there is need, and apparently opportunity, for research to develop a more efficient, economical, and salable product".

2. "Businesses should be constantly alert and vigorous to improve their marketing methods, to make sure that the consumer is well informed and efficiently served, and that the producer is aware of potential markets."

While CED agrees that what American business needs is to "get out and sell", it believes that something more constructive and more difficult than high-pressure salesmanship is involved. It recommends: first, *market research,* which in their view involves not only detecting preferences among existing products but also discovering wants that only new products will satisfy adequately; second, *informing the consumer* of products which might serve his wants better; third, *increasing efficiency and reducing costs* of distribution.

3. "If sales decline, businesses should not automatically cut selling effort and advertising budgets, as they have often done in the past. They should appraise the possibilities that will exist for maintaining sales by redoubled effort in an economy where incomes and savings will still be large."
4. "Businesses should follow a more stable inventory policy. They should avoid speculation, either on the up side or the down side, but should keep at all times the minimum balanced inventory needed for efficient operation."

CED observed that "recessions have sometimes been initiated by declines in business inventories and have almost always been aggravated by such declines. . . . But the extent of the inventory decline that typically occurs in a recession is unnecessarily and uneconomically great."

CED advises the ordinary manufacturing or distributing business not to speculate with its inventories, saying, "The chances of out-guessing the market on price are not so good as to justify departure from the minimum stock level needed for efficient operation."

5. "Plant and equipment expenditures of businesses should be based on a long-term view of their contributions to the purposes of the enterprise. In this long-term view the current state of business, whether booming or depressed, should be placed in the perspective of the rate of growth and degree of stability that may reasonably be expected."

CED believes that the adoption of such a long-term view would lead to a more stable investment policy. It would also reduce the costs of construction and equipment since they tend to be lower during periods of recession.

6. "Businesses should strengthen their financial structures, partly by less reliance upon short-term borrowing."

CED recognizes that *unstabilizing* investment policies have been forced on many businesses in the past by their inability to obtain funds when business is declining and that correction of this situation requires the co-operation of the banks. But it also points out that if the businessman gave greater attention to putting his house in order in times of prosperity, he would have greater borrowing power in times of readjustment.

7. "The vigor and inventiveness that American business has shown in many other fields should be brought to bear upon the problem of more rapid and steadier economic growth."

In past studies, CED found that businesses could do this more effectively if they set up their internal organizations systematically for this purpose.

8. "Trade associations have an important job of research and education in applying to their own industries such general precepts as those listed above on what business can do. In addition, they can help to obtain more up-to-date and com-

(*Continued on page* 92.)

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Heavy-Media Separation Supplements Flotation in Magnesite Plant

Removes impurities from raw materials ahead of kilns

another ON THE SPOT report

THE low mountains of Stevens County in northeast Washington, surrounding the town of Chewelah, possess one of the country's largest known reserves of magnesite. For nearly 40 years, the Northwest

By HARRY F. UTLEY

Magnesite Company has worked these deposits, principally to supply the basic-refractory needs of such well-known concerns as the General Refractories Company and the Harbison-Walker Refractories Company.

Mining is done by the open-quarry method and much of the ore, prior to final reduction, is transported over the rugged terrain by a 12½-mile system of aerial tramways.

The quality of the material varies considerably, dolomite being the chief contaminant, together with some greenstone, quartz, other silicates, and shale. In color it ranges from black through grayish blue to pink and white. In earlier years the ore was painstakingly hand-sorted. Some relief from this tedious task was obtained a decade or so ago when a flotation mill was installed to upgrade the material; and still more recently heavy-media separation has been put to work to free the magnesite of its impurities before it is reduced to magnesium oxide in the kilns. In this connection, it is of interest to note that while output of finished product has increased, only about 165 men are today on the payroll, compared with about 500 —most of them hand-sorters—along about the time World War II began!

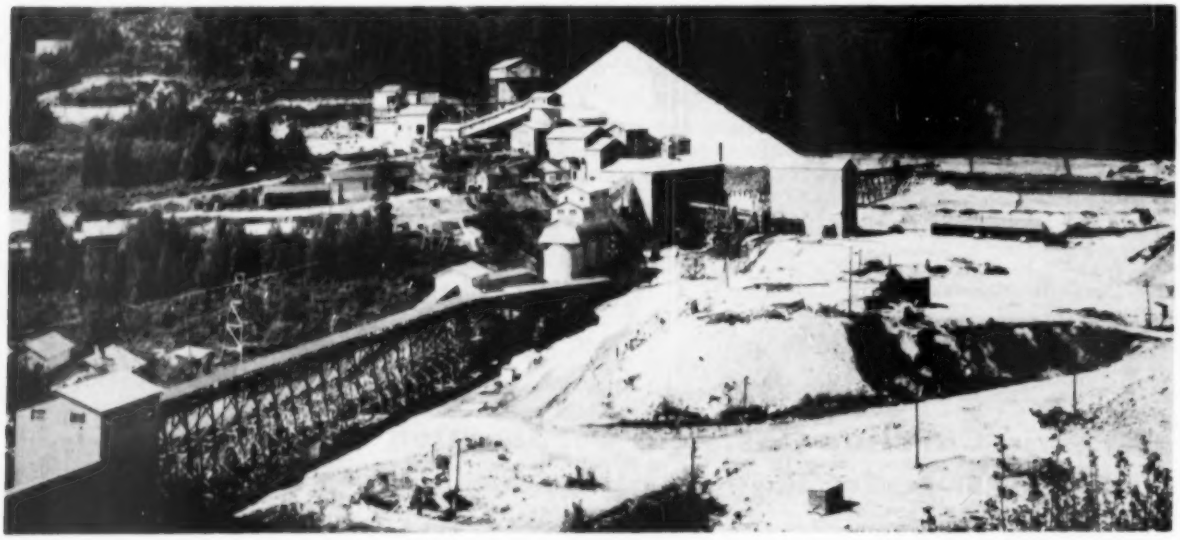
Since the Chewelah operations have been described earlier, except for the sink-float phase of beneficiation, this resume is devoted chiefly to a description of the heavy-media-separation department.

The concentrating plant is about 4 miles uphill as the crow flies from the reduction plant in Chewelah. Four quarries have been opened and worked on the extensive deposits; the Finch and Allen quarries, adjacent to the concentration plant, are the oldest. The other two, Keystone and Red Marble, are more recent developments and are some distance from and at a higher altitude above the plant. Some ore is still taken from the Finch and Allen quarries, and haulage to the plant bins is by truck, while both the Keystone and Red Marble properties are served by tramways.

The Red Marble quarry is the main source of supply and the largest of the company's quarries. Here a Joy Heavyweight 6½-in. blast-hole drill recently supplanted other drilling equipment. Primary crushing at Red Marble is done by an Allis-Chalmers 42-in. gyratory machine which reduces the crystalline ore to minus 5-in. size before it is surge-stockpiled at the upper tramway terminal. The quarry is at an elevation 1,300 ft. higher than the concentrating plant, and the tramway connecting the quarry and the mill is approximately 8 miles long.

Ore is delivered to two 1,200-ton storage bins at the concentrating plant. From the bins a Link-Belt reciprocating feeder and belt-conveyor deliver to a pair of Link-Belt 4- by 21-ft. revolving scrubbers. The lower halves of the scrubbers are perforated to split the material at 1¾ in. for primary separation. Water is

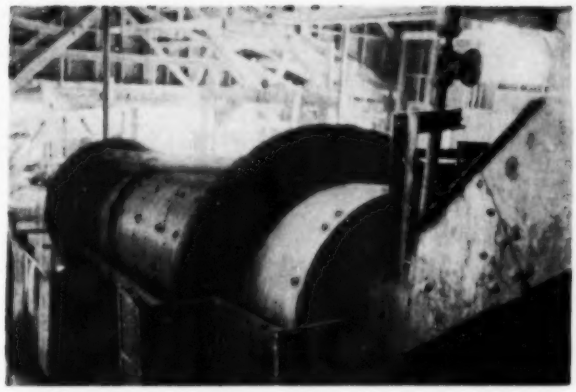
A general view of the Northwest Magnesite Company's heavy-media-separation plant near Chewelah, Wash. The big pile which dwarfs the plant structures contains more than 1,000,000 tons of tailings. The conveyor in the foreground leads to the flotation plant seen in the lower left corner.



added at the scrubber feed ends at the rate of 250 g.p.m., while an additional 75 g.p.m. is applied by sprays in the perforated sections. Oversize coming off the end of the screen section passes to a pair of Traylor gyratory crushers, one a 36-in. TY machine, the other a 10-in. Type T unit. The minus 1¾-in. ore and the wash water from the scrubber are flumed to a Ty-Rock 4- by 10-ft. double-deck screen, the plus 3/16in. minus 1¾-in. rock joining the product of the two Traylor crushers. Screen troughs are deslimed, any minus 65-mesh material going to waste with the dirty water, while the recovered plus 65-mesh minus 3/16-in. fines are dewatered by a Wemco 60-in. spiral before going on to the flotation-department feed bins.

Breakage from the Traylor crushers is passed over a pair of Ty-Rock 4- by 10-ft. screens to make a plus 3/16-in. minus 1¾-in. feed for the separatory cone in the H.M.S. department, the screens being close-circuited with the crushers, any minus 3/16-in. product taken out being by-passed to the washer-waste-recovery system which yields flotation-plant feed.

A 120-ton surge bin feeds the Wemco 20-ft. diameter separatory cone in the H.M.S. circuit, rate of feed being variable between 110 and 160 t.ph. depending upon the quality of the ore. Separation of the magnesite from the gangue occurs in the cone, the media consisting of water and ferrosilicon in proportions designed to provide a specific gravity of 2.9, which allows the magnesite fraction having a specific gravity in the 2.94—3.01 range to sink while the tailings float. The ferrosilicon is a 50-50 blend of 65- and 48-mesh



One of the two 4- by 21-ft. scrubbers which make the initial separation and clean the rock preparatory to beneficiation by heavy-media separation or froth flotation.

mineral, and the media is maintained within close limits of .005 of the desired specific gravity 2.9 by a pair of Bristol recorders. Contents of the cone are agitated constantly both by air and mechanically; the sinks are raised to a launder by an outside air-lift.

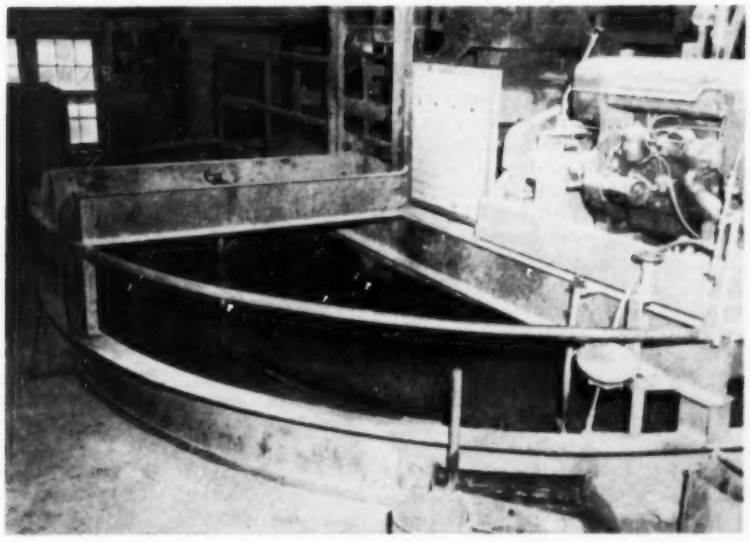
Two Ty-Rock 5- by 12-ft. screens follow the separator, one handling the sinks, the other the waste floats. Most of the media drains through the first 4 ft. of the 12-ft. screen sections and is pumped directly back to the cone. The last 8 ft. of the screens are equipped with sprays to wash off any remaining ferrosilicon, and this dilute media is then sent through a reclaiming circuit before it can be used again. In reclamation, the water-thinned media first passes a set of magnetizing coils to promote flocculation before it enters a Wemco thickener for initial dewatering. The thickener underflow is then pumped to two Dings magnetic separators in series to extract the magnetic concentrates, which are finally dewatered by a Wemco densifying screw, demagnetized, and returned to the media circuit supplying the cone separator. Media loss is remarkably low, about 0.3 lb. per ton of ore fed to the cone.

The two 5- by 12-ft. screens function primarily, of course, as recoverers of the ferrosilicon media. Floats are wasted—for the time being, at least—and are carried to a huge waste pile adjoining the plant by a short tail-back tram. This pile is estimated to contain well over 1,000,000 tons. Eventually the company hopes to find a market for the accumulation.

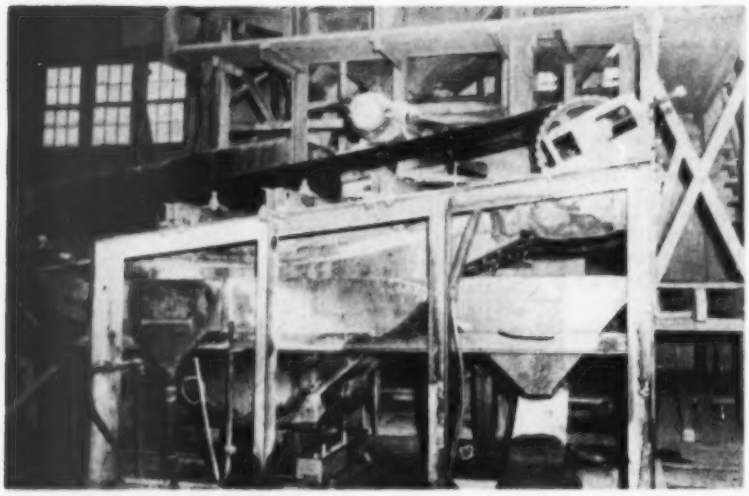
The magnesite (sinks) coming off the other screen is subject to further crushing, first by a pair of Traylor 36-in. multi-stage crushers. The product, at this stage in the minus 1-in. range, then passes over two Hum-mer 4- by 10-ft. screens fitted with ¼-in. wire cloth. Throughs are the finished product; they are stored in three bins with a combined capacity of 1,800 tons. This material is destined for delivery by tramway to the reduction plant at Chewelah. Plus ¼-in. rejects are further reduced in size by two sets of Allis-Chalmers 42- by 16-in. double rolls, closed-circuited with the Hum-mer screens. Capacity of the H.M.S. plant is about 1,000 tons per 8-hr. shift.

The adjoining flotation plant treats mine ore fines, reclaimed washer tailings, and some minus 3/16-in. make-up drawn from the H.M.S. plant concentrate bins. All feed to the flotation machines is first ground to 65 percent passing 100-mesh. Flotation concentrates are thickened, filtered, and dried to cake before being trammed to the reduction plant.

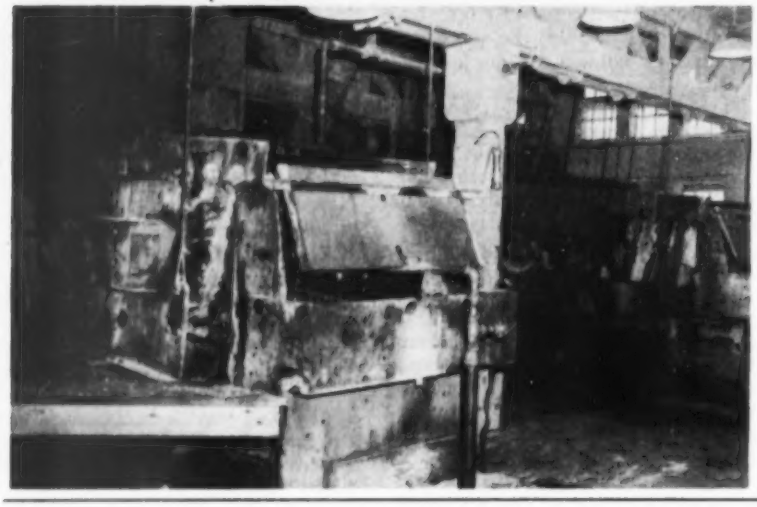
The aerial tramway system (8 miles from Red Marble quarry to the beneficiation mills, and over 4 miles



A part of the 20 ft. cone separator containing specific gravity 2.9 ferrosilicon media. The heavier magnesite sinks and is recovered by air lift, while the lighter gangue minerals float.



One section of the media-recovery system. The magnetic separators are shown taking out the previously-magnetized ferrosilicon particles.



The two 5- by 12-ft. vibrating screens, one of which handles magnesite sinks, the other waste floats. The prime purpose of the screens is to take out the heavy media for re-use in the separatory cone.

from the mills to the reduction plant) is downhill for the loaded buckets most of the way, and power costs are consequently low, since the motors largely feed back into the line as generators. Buckets on the quarry-to-mill line each carry 2,000 lb.; from mill-to-reduction plant 1,100-lb. buckets are carried.

The Chewelah reduction plant is served by the Great Northern Railroad. Here the concentrates from the H.M.S. and flotation mills are burned at about 2,900 deg. F. to yield magnesium oxide. The main burning unit is a Smidth 9- by 307-ft. rotary kiln equipped with Unax coolers. Six old Bonnot 7- by 125-ft. kilns remain operative but are usually in stand-by service. Some of the concentrate is burned straight, while some is mixed with a small amount of iron oxide. Cottrell precipitators recover dust from the kiln-exhaust gases. The reduction plant is also equipped with the necessary crushing, grinding, and screening equipment to prepare a finished product sized to meet the varying needs of the trade.

Howard A. Ziebell is general manager; Roger Fisk supervises quarry and mill operations; and T. W. Morton is in charge of the H.M.S. plant.

Washington News

(*From page* 88.)

plete statistical information on inventories, sales, and other subjects."

This, then, is the blueprint that can be adopted by individual businessmen or groups of businessmen through their trade associations to fight recession.

In recent years, trade associations do not seem to have done as much as they could to improve the collection and analysis of reliable statistics in the operation of their industries. Many government statistics have been permitted to decline in quality. Censuses of manufacturing and distribution have been postponed or eliminated entirely. Unreliable sampling studies have been substituted for overall censuses. Much of this has been done in an attempt to cut down the high cost of government. Businessmen in and out of government are beginning to question the wisdom of saving the government a million dollars by eliminating the collection of information which, if it were available, would save businessmen many times that much.

A. P. Green Firebrick Buys Companies in Texas, England

Two recent acquisitions have been announced by the A. P. Green Firebrick Company, Mexico, Mo., manufacturers of refractory clay and brick. At Sulphur Springs, Tex., it has acquired the 30-year-old Thermo Fire Brick Company's facilities, which will continue to be operated with essentially the same personnel in charge.

The second firm purchased recently by the Green interests is Liptak Furnace Arches, Ltd., London, England, which has a plant near Manchester. Liptak has for many years manufactured and sold refractory specialties carrying A. P. Green brand names under license arrangements. No change is contemplated in management or operation personnel.

Change in Corporate Name Posted by Development Firm

According to a recent announcement, the name of the Cement and General Development Corporation, New York City, has been changed to the Canadian and General Development Corporation. It was stated that the change was made "because of recent broadening of the company's industrial development activities, particularly in regard to operations in Canada."

Activities pertaining to the cement and nonmetallic minerals industries, it was indicated, will be continued by a division of the corporation under the name of the Cement and General Development Company.

The nearly 184,000,000 lb. of bromine and bromine compounds sold by primary producers in the United States during 1952 was the largest volume of sales ever recorded, according to reports of producers to the U. S. Bureau of Mines.

● A panoramic view of the new 200-t.p.h. sand-and-gravel plant of Century Rock Products near El Monte, Calif. The storage pile at the right is unwashed sand, a product sold to asphalt plants.

200 T.P.H. AGGREGATE PLANT

★★★

Opened to Serve Growing R.M.C. Business

By HARRY F. UTLEY

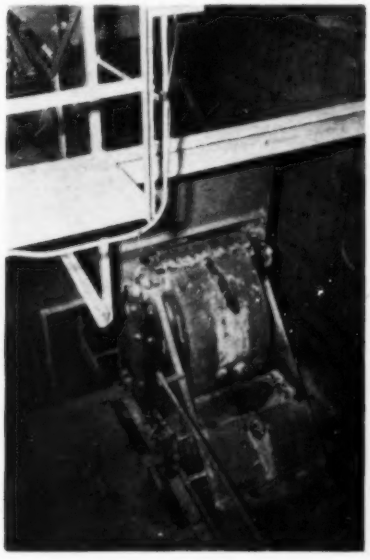
another ON THE SPOT report

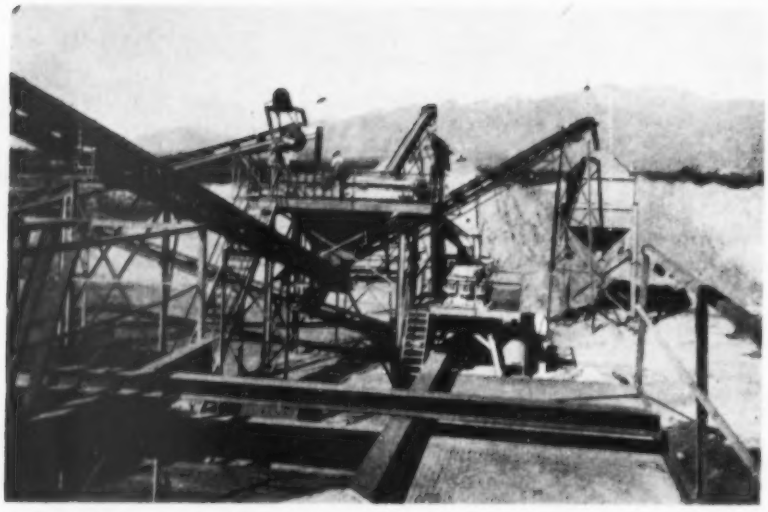
E. O. "ORRIE" Rodeffer returned to his home in Los Angeles late in 1945 after serving a hitch in the United States Navy. Prior to his military service he had engaged in concrete construction work in southern California, and the huge post-war building boom just then getting underway in Los Angeles County convinced him that ready-mixed concrete offered a high-ranking business opportunity.

Early in 1946 he established the San Gabriel Valley Ready Mixed Concrete Company, opening a batching plant in San Gabriel. Expansion soon followed, the concern acquiring two plants in Pasadena, another in El Monte, and one in Sunland. A fleet of 33 truck-mixers, most of them Challenge units, is now in operation.

● Below, right: E. O. Rodeffer (left), owner, and F. E. MacDonald, superintendent of the new plant at El Monte.

● Below: the 30- by 15-in. primary jaw crusher in the concrete pit below the plant hopper.





● The scalping screen and the secondary-crusher installation. The pile of unwashed sand destined for asphalt plants is seen just beyond.

As the business grew and the consumption of purchased aggregates approached the 500-ton mark daily, Mr. Rodeffer, for economic and security reasons, decided to build his own aggregate-producing facilities and acquired a suitable deposit near El Monte for the purpose.

The new plant on the El Monte property, known as Century Rock Products, began operation in August, 1953. It has a capacity of nearly 200 t.p.h. of washed and graded material. Design and erection were under the supervision of Superintendent F. E. MacDonald and Hal Jacobs, consulting engineer. It is an all-steel job, largely automatic in operation, with ample provision in the foundations and structurally for expansion. Reflecting the excellent design, the plant was started up and ran 7 full hours on its opening day; and according to Mr. Rodeffer, it has continued to operate at least 8 hours a day ever since without down-time. About half the output is utilized by the affiliate's batch plants, the remainder being marketed f.o.b. at wholesale, chief customers being other ready-mix operators in Los Angeles County.

The pit is worked by a Northwest 80D 2½-cu. yd. shovel loading into Euclid end-dump trucks which carry about 28 tons per load. The haul is short, ranging between 500 and 700 ft. between the shovel and the plant hopper.

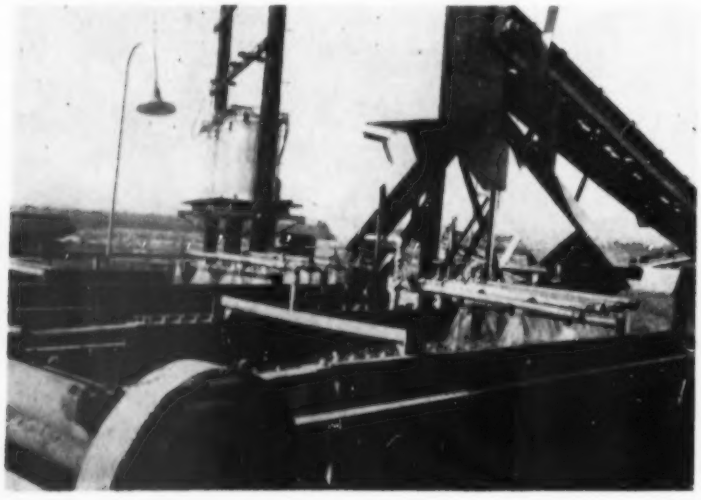
From the 110-ton-capacity hopper, a Syntron feeder puts the pit-run material over a sloping grizzly, the plus 2-in. rejects going directly into a Kue-Ken 15- by 30-in. primary jaw crusher. Set to break at 1½ in., the crusher reduces the hard boulders to size without laboring during feed surges, delivering a cubical product which joins the grizzly throughs on a 30-in. by 150-ft. belt conveyor running up to a Symons 4- by 12-ft. double-deck dry scalping screen. Any plus 1¼-in. rock rejected on the top deck is chuted to a Symons 3-ft. standard cone crusher closed-circuited with the main belt by a short return conveyor.

The remainder of the screen products are processed as concrete aggregates — or the minus 5/16-in. sand can be diverted to a separate storage pile for sale, unwashed, to asphalt plants. This unwashed sand normally goes by a 20-in. by 60-ft. conveyor to a 50-ton truckloading bin. When the bin is full, a bin-level indicator automatically stops the belt, and the sand is by-passed to another and longer belt operating as a stacker to build up a surplus pile. Just as soon as a truck starts to load from the bin, however, pulling its capacity level down, the stacker belt stops and the belt feeding the bin again goes into action, keeping the bin full at all times.

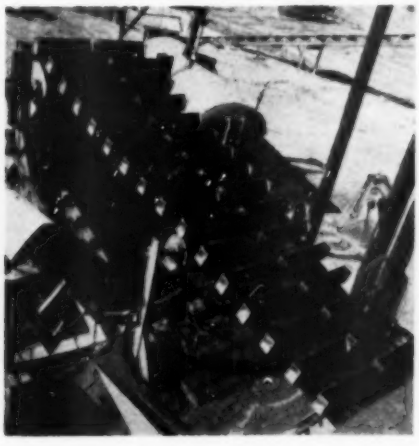
The sand, optionally, may all go to the "hot-plant" side, or the entire supply can be sent to the washing-and-screening department. If there is production demand for both, the sand from the dry screen may be split to feed in both directions in any proportion. At present the shallow pit working yields a surplus of fines, and fortunately there is a good demand for unwashed asphalt sand; so production is kept well in balance. Later, as the pit is dug below the 25-ft. level, more coarse material will be encountered.

A 24-in. by 80-ft. belt conveyor carries the product of the scalper screen to the washing department for cleaning and classification over two Symons 4- by 12-ft. screens. These identical screens, arranged in

● These two horizontal spray-equipped screens wash and size all coarse aggregates.



● This view of the sand drag designed at the plant shows the type of steel flights used.



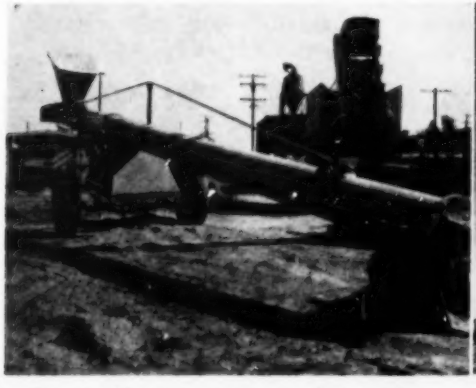
tandem, are equipped with sprays. The three washed and sized gravels are carried off by stacker belts to build up storage piles over a recovery tunnel. Bottom-deck throughs are processed for sand, either in concrete or plaster sizes, by changing the wire-cloth mesh on the lower decks. The bulk of the sand is concrete grade, however. It is washed and watered by a large-capacity drag consisting of a 60-in. wide rubber belt fitted with steel paddles and turning on 24-ft. centers in the tub. A radial stacker belt distributes the sand over a kidney-shaped area above the recovery tunnel to allow ample time for complete drainage. The discharge end of the radial belt is 50 ft. above ground level, calculated to build a 20,000-ton capacity pile.

The reinforced-concrete recovery tunnel is 5 by 6 by 275 ft., the belt conveyor within being 24 in. by 270 ft. There are 12 feed gates, each equipped with a short belt-feeder; five of the gates are under the sand end and the remaining seven under the gravel end. At the end of the recovery run, the horizontal tunnel belt transfers to a 24-in. by 125-ft. inclined conveyor which runs up to the 4-compartment, 180-ton elevated bin over the scale where the delivery trucks are loaded. Bin compartment gates are air-ram operated; and since loading takes place after the empty truck drives onto the 45-ft. scale platform, the desired weight can be loaded in even tons, without overage or discrepancies to compute. This practice saves a good deal of time at the scalehouse. One man is able to perform all the duties, including filling the bin compartments with the proper sizes of materials, since the feeders in the recovery tunnel are controlled from the scalehouse.

(*Continued on page* 103.)

● This radial sand stacker can build up a 20,000-ton drainage and storage pile.

● The transfer point of the tunnel belt and the recovery conveyor leading to the truck-loading bins.



● The portable screw conveyor used to transfer bulk cement at the company batch plants.

● One of the 33 truck mixers operated by the company's affiliate, pouring on the Arroyo Bridge, a job involving about 60,000 cu. yd. of concrete.

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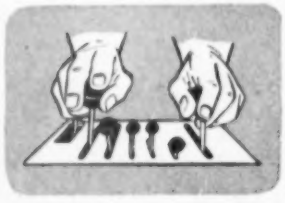

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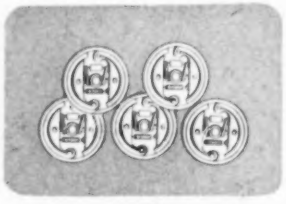

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Why Soil Needs Lime*

By ROY L. DONAHUE
Chairman, Department of Agronomy
University of New Hampshire, Durham, N.H.

BEFORE the birth of Christ lime was used on cropland to increase its productivity. All through the ages lime in some form has served a similar purpose. Records of crop growing by the Pilgrims credit them for using wood ashes, which is mostly lime, and for a limited use of burned limestone.

During the years between 1818 and 1848 Edmund Ruffin of Virginia carried on experiments with the use of burned limestone. He found that with lime he could increase wheat yields from an average of 15 to an average of 20 bushels per acre. Corn also increased in yield from 14 bushels without lime to 29 bushels with lime.

During the last 100 years the use of lime has increased in direct proportion to the increase in knowledge regarding its value. Especially since 1929 tonnages of lime on farm lands have increased from less than 4,000,000 a year to 8,000,000 tons by 1939. The use of lime had doubled again by 1942 to 16,000,000 tons, and reached a maximum of 30,000,000 in 1947. Since 1947 the nation's annual usage has leveled off at approximately 25,000,000 tons.

Most of the rapid increase in the use of lime has come about through the assistance of the Agricultural Conservation Program. Lime purchased entirely by farmers has shown a slow but steady increase since 1900.

Although the use of lime has increased quite rapidly, farmers have never used even half as much as they need for the most efficient production. Seventy million tons of lime is the desirable annual requirement necessary to achieve the greatest net profit from our farm lands.

What Lime Does in the Soil

Lime neutralizes soil acidity, supplies essential calcium and sometimes magnesium, increases the availability of many elements, improves soil structure, and increases all soil life.

Most crops grow best in soils that are only slightly acid. In strongly acid soils, several substances, such as aluminum, appear to be toxic to plants. Proper liming of acid soils makes these toxic compounds less harmful to plants

Most forms of lime contain calcium and magnesium, which are two of the 15 elements needed for plant growth. Calcium is found in the inner cell wall of every plant cell, where it acts to help make the plant more selective in what it absorbs. Calcium is also needed in large amounts in the production of seeds and in the movement of starches and sugars within the plant. For livestock and man, calcium is necessary in increasing amounts on the land, so that food and feed crops will be richer in this element. Human beings and animals eating plants produced on low-calcium soils may suffer calcium deficiency. Bones, teeth, eggshells, and milk all normally contain large amounts of calcium.

Without magnesium there would be no green chlorophyll in nature, for each molecule of chlorophyll contains one atom of magnesium. Plants

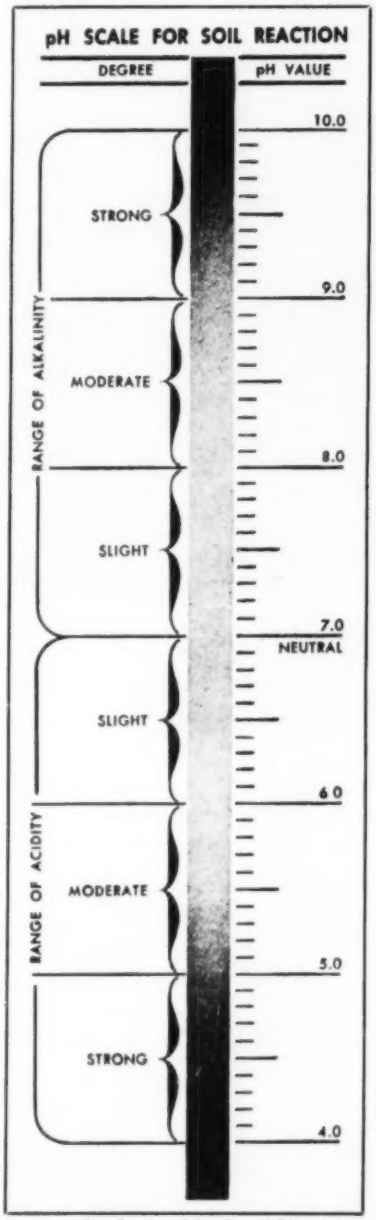
*Adapted from Chapter 8, *The Use of Lime*, from a forthcoming book by the author of *Our Soils and Their Management*, to be published this summer by the Interstate of Danville, Ill.

LIME LINE
LEGEND
X - AREAS OF SOILS DOMINANTLY VERY RICH IN LIME (CALCIUM CARBONATE)
A - AREAS WHERE SOILS AND PARENT MATERIALS ARE DOMINANTLY RICH IN LIME, THOUGH SURFACE SOIL IS SOMEWHAT ACID IN PLACES
B - AREAS WHERE SOILS ARE ACID BUT LIKELY TO CONTAIN IN OTHER AVAILABLE FORMS AS MUCH CALCIUM AS DEEP-ROOTED PLANTS NEED
C - AREAS OF ACID SOILS, POOR IN LIME AND OTHER AVAILABLE FORMS OF CALCIUM
AB - AREAS HAVING MIXED PATTERN OF SOILS OF HIGH AND MEDIUM LIME (OR AVAILABLE CALCIUM) CONTENT
BC - AREAS HAVING MIXED PATTERN OF SOILS OF MEDIUM AND LOW LIME CONTENT
ABC - AREAS HAVING MIXED PATTERN OF SOILS OF HIGH, MEDIUM, AND LOW LIME CONTENT

Figure 1. Where lime is needed. The "lime line" roughly divides the nation into lime-accumulating and lime-deficient areas. The northern end of this line receives approximately 20 inches of average annual precipitation and the southern end 30 inches. Source: U.S.D.A. Famers' Bulletin No. 1845.

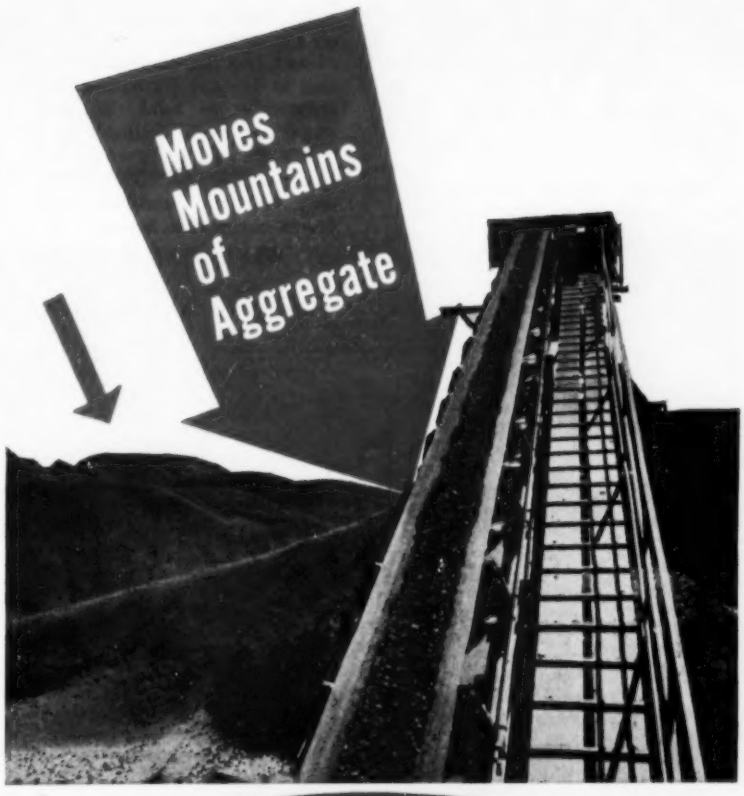
cannot manufacture oils and fats without large amounts of magnesium, which is also vital to all animals and to man.

Lime on strongly acid soils increases the availability of nitrogen, phosphorus, potassium, and molybdenum. By hastening the decay of organic matter, calcium makes more nitrogen available to plants. Phosphorus in strongly acid soils is tied up in slowly soluble iron phosphate. Lime helps to release some of this



Source: *"Our Land and Its Care."* The American Plant Food Council, Washington, D.C.

Figure 2. The pH scale for soils varies from 4.0 to 10.0, but the usual range is 5.0 to 7.0. For most agricultural crops the most desirable pH is 6.5.



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phosphorus so tied up. Additional potash is made available by lime because calcium and magnesium replace some of the potassium on the clay surfaces. Molybdenum is the only minor element whose availability is increased by liming.

Lime improves the desirable structure of the soil so that its capacity for both air and water is increased. This increase in water-stable soil granules is brought about mostly by an increase in the amount of organic, slimy, binding materials. The slime on an earthworm is a good example of such binding materials. Lime also aids in granule formation by acting chemically to bind the clay into larger and more desirable granules.

All soil life is increased by lime. Lime encourages root growth, hastens bacterial multiplication, and favors earthworm activity.

Where Lime Is Needed

In regions of high rainfall lime leaches out of the soil slowly but con-

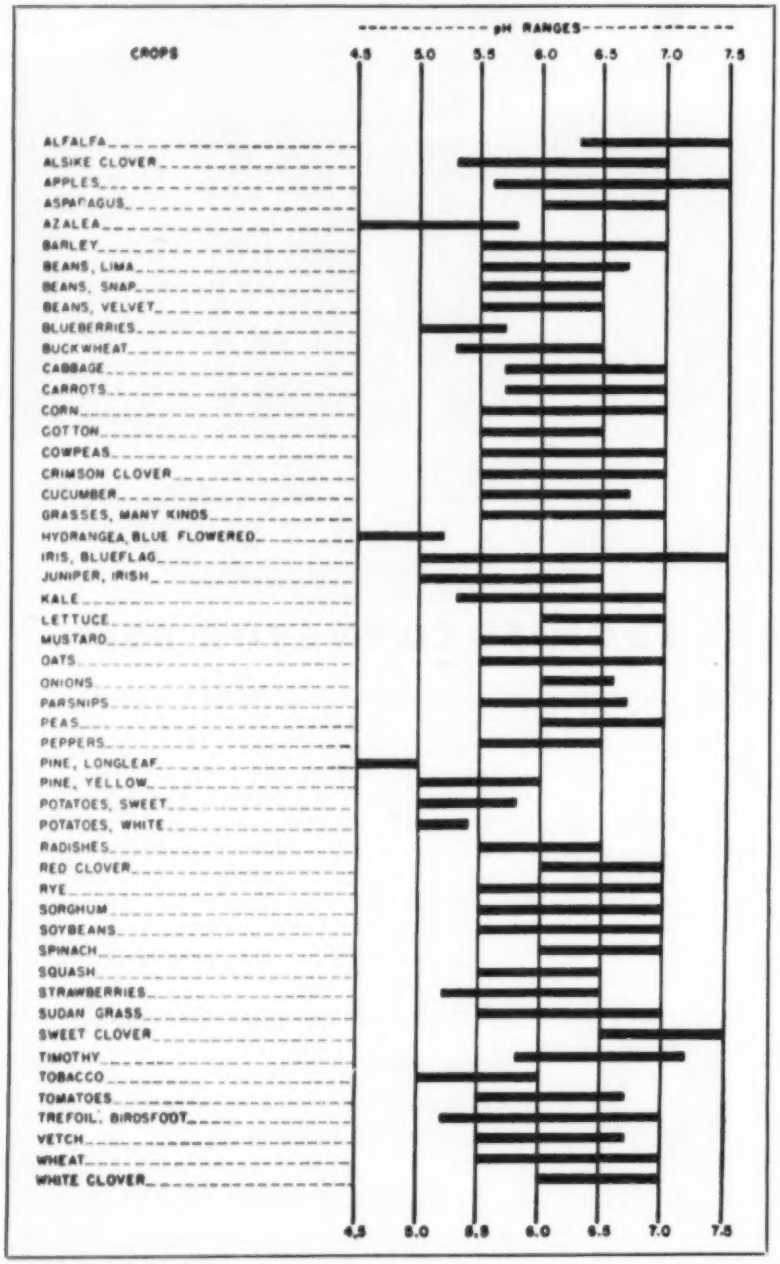

Figure 3. The desirable pH range for the more common crops. Alfalfa and sweet clover have the highest pH requirement, while azaleas and blueberries are among those plants having the lowest.

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tinuously. As a result, nearly all well-drained soils in humid regions are acid.

East of the "lime line" (see Figure 1) most upland soils need lime for the best production of nearly all farm crops. West of this line only the high-rainfall areas of Oregon, Washington, and California are acid and need lime. Some well-drained sandy soils west of this line also are in need of lime.

A comparison of this "lime line" with the average annual precipitation is of interest. In northern Minnesota the "lime line" runs through the region which receives 20 inches of annual precipitation. In Nebraska, Kansas, Oklahoma, and Texas the 30-inch belt of precipitation more nearly coincides with the "lime line".

An explanation appears to be needed to understand why 20 inches of precipitation in Minnesota is equal in lime-leaching ability to 30 inches farther south. The reason for less leaching of lime in Minnesota with each inch of annual precipitation is due to the cool climate, where evaporation is low. Farther south each inch of precipitation is less effective in the downward leaching of lime because of the higher rate of evaporation. Much of the total precipitation in the more southerly states evaporates into the atmosphere and thus does not add to the total water capable of leaching lime downward.

It must not be assumed that all soils east of the "lime line" need lime to improve their productivity. Sloping soils which have developed from limestone are usually adequately supplied with lime; also soils that have developed from soft limestone or marl do not need lime. Soils of the Texas and Alabama blacklands are examples of soils in humid regions which do not need lime because they have been derived from soft limestone. Some soils in river valleys are acid and some are adequately supplied with lime, depending upon the nature of the sediment carried and deposited by the river.

The only way to ascertain whether the soil needs lime is to see the county agricultural agent about having your soil tested. Testing takes the guess out of liming.

Lime Requirements

Lime requirement must first start with the needs of the plant to be grown. For example, if the crop to be grown is acid-loving blueberries, no lime is needed. Alfalfa needs are different, however. Both alfalfa and the clovers will not grow well unless a large amount of lime is present.

Amounts of lime in the soil are very closely related to soil pH. Since pH is more easily determined than is the amount of lime, the term pH will be used when discussing lime requirement.

The pH scale in relation to the degree of acidity may be seen in Figure 2. This chart shows that pH 7 is neutral; numbers greater than 7 are alkaline; and numbers less than 7 are acid. A point between pH 6 and 7 is desirable for most field crops, with 6.5 usually the most suitable.

The pH ranges most desirable for the common field crops, vegetable crops and fruits are shown in Figure 3. This figure verifies the previous statement that blueberries do not need lime, while alfalfa is at the top of the list in requiring a high pH, which we have agreed to call also a high lime requirement.

Once the suitable pH range is known for the crop to be grown, the problem becomes one of testing pH of the soil to find out if lime is needed. For example, if the soil has a pH of 5.5 and alfalfa is to be grown, the problem then is to try to determine how much lime is needed to raise the pH to 6.5, the minimum pH for alfalfa.

Another clue to lime requirement is to study the calcium and magnesium content of various common farm crops. Table 1 shows that alfalfa contains more calcium than any other crop, and as much magnesium as turnip leaves. The small-grain crops, such as wheat, contain the least amounts of both calcium and magnesium.

All soils resist a change in pH due to the clay and organic matter present. Table 2 shows the amount of lime (in relation to soil texture) needed to change the pH of the soil one unit. These values are for soils with an average amount of organic matter.

Table 2. Limestone Needed in Relation to Soil Texture to Raise pH of Soil*

Soil Texture	Pounds of Limestone per Acre Required to Raise pH Value One Unit
Sand	1,000
Loamy Sand	1,500
Sandy Loam	2,000
Loam	2,500
Silt Loam	3,000
Clay Loam	4,000
Clay	5,000
Muck	8,000

The above recommendations are for soils of average organic matter content. If the soil is very low in organic matter, use one-half of the above rates; if exceptionally high in organic matter, double the rate of application to achieve the same results.

*Adapted from *Laboratory Manual for Introductory Soils* by Roy L. Donahue, The Interstate, Danville, Ill., 1952.

Table 1. Amounts of Calcium and Magnesium in Harvested Portions of Farm Crops*

Crop	Yield per Acre	Calcium Pounds	Magnesium Pounds
Alfalfa	3 tons	100	20
Apples	300 bushels	1	1
Barley, grain	40 bushels	1	2
Barley, straw	1 ton	3	1
Beet roots, red	10 tons	5	3
Bluegrass	2 tons	15	5
Cabbage	10 tons	30	10
Carrots	5 tons	5	2
Clover, red	2 tons	50	15
Clover, sweet	2 tons	40	10
Corn, grain	50 bushels	1	3
Corn, stover	3,000 pounds	10	5
Cotton, lint	500 pounds	1	1
Cotton, seed	1,000 pounds	2	5
Cowpea hay	2 tons	50	15
Flax, grain	15 bushels	2	3
Flax, straw	1 ton	10	3
Lespedeza	2 tons	50	10
Oats, grain	50 bushels	1	2
Oats, straw	2,500 pounds	5	2
Onions	400 bushels	10	5
Potatoes	400 bushels	2	7
Rye, grain	20 bushels	1	1
Rye, straw	1 ton	3	1
Soybeans, grain	25 bushels	10	10
Soybeans, hay	2 tons	30	15
Timothy hay	2 tons	10	5
Tobacco	1 ton	50	10
Turnips, leaves	5 tons	60	20
Turnips, roots	10 tons	10	5
Wheat, grain	30 bushels	1	3
Wheat, straw	3,000 pounds	5	2

*Source: U.S.D.A. Farmers' Bulletin No. 2032

Our big problem is to get the soil ready to produce luxuriant alfalfa, and to do this we need to change the soil pH from 5.5 to 6.5, or one whole pH unit. Assuming that we have a sandy loam, a glance at Table 2 shows that it takes 2,000 lb. of lime to raise the pH of the soil one whole unit. Our lime requirement for alfalfa to be grown on a sandy loam soil with a pH of 5.5 is, therefore, 2,000 lb. per acre.

The same soil texture, but with a small amount of organic matter, would require only half of this amount, or 1,000 lb. On the other hand, a soil very high in organic matter would need twice as much, or 4,000 lb. of lime per acre to raise the pH value one unit.

This discussion on lime requirement has been restricted to the initial use of lime at the time a crop is to be planted. With a perennial crop such as alfalfa, which may persist for more than 5 years, the pH of the soil should be determined at the end of 5 years and the desired amount of lime again added.

On the average it takes approximately 500 lb. of lime per acre each year to maintain the soil pH at any desired level. For this reason a soil test at least once every 5 years will enable the land owner to know whether he is using enough lime for maximum crop yields.

200 T.H.P. Aggregate Plant

(*From page 95.*)

All equipment controls are interlocked, and master switches are centralized. Operating horsepower totals only about 325, all motors being geared-head units taking power at 440 volts. Every bearing in the plant and plant machinery is antifriction to reduce lubrication maintenance. The conveyors were furnished by Hewitt-Robins and the idler and return-roll bearings are triple-grease sealed, requiring lubrication only about once a year.

Wash-water requirements of 350 g.p.m. are supplied from a 250-ft. well on the property by a Wintroath deep-well turbine pump.

Vermiculite Output, Value Steady in 1950-1952 Period

Almost the same tonnage of vermiculite was produced in the United States in each of the three years 1950-1952, and the value of the screened and cleaned material at the mine was quite uniform. In 1952 the output totaled 208,906 tons, valued at $2,081,993. The production is largely concentrated in Montana and South Carolina, with smaller quantities coming from North Carolina and Wyoming.

Assuming a tonnage loss of 5 percent in processing, it is estimated that about 200,000 tons of exfoliated vermiculite was produced in 1952. Value estimates have ranged up to $80 a ton f.o.b. plant, but the national average is probably somewhat below that figure. Total product value, therefore, may have reached $15,000,000 in 1952 for this commodity. There are about 50 exfoliating plants in the United States located in 31 states and the District of Columbia. Recovery of vermiculite from low-grade ores, formerly considered to be waste material, was the objective of a program at one of the large mines in Montana. Low-grade ore in this case is defined as material containing 35 percent or less vermiculite.

A two-week layoff of 100 of the 140 employees at the Penn-Dixie Cement Corporation's plant at West Des Moines, Iowa, ended on April 19, and full production was resumed. According to R. A. Bechtold, superintendent, resumption of 100 percent production was made possible by a rise in shipments.

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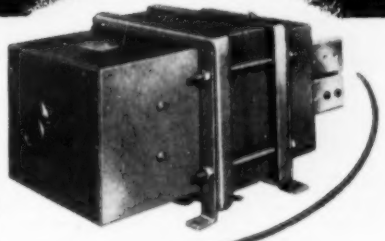

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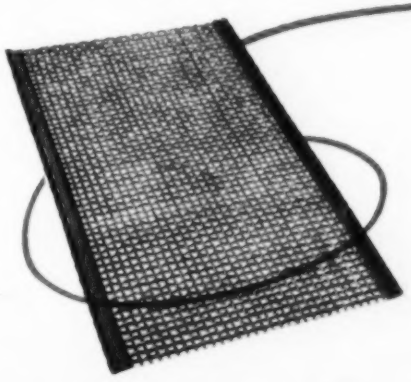

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DRAINAGE PROJECT PREVENTS FLOODING OF NORTHERN OHIO QUARRY

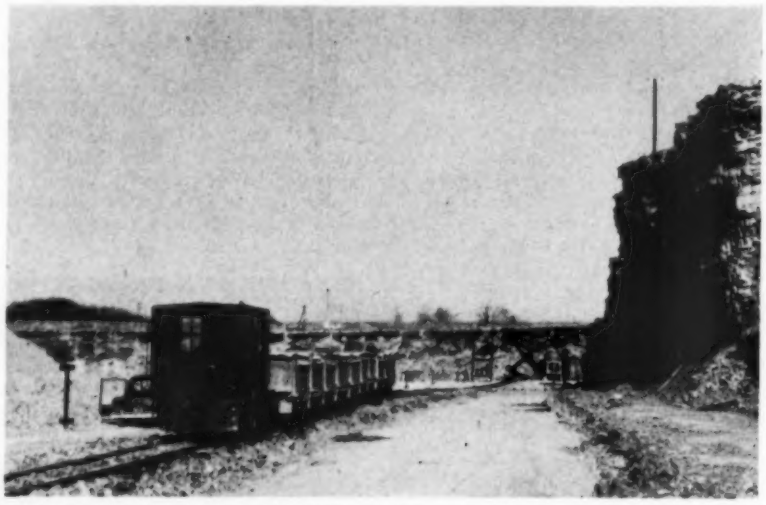
THE National Lime and Stone Company operates a limestone quarry at Lima, Ohio, which requires flood protection from the nearby Ottawa River. Levees projecting about 20 ft. above the bedrock surface are constructed around the

By S. H. FRIESNER
General Superintendent
The National Lime and Stone Company

quarry area, which lies between the river and the New York-Chicago main line of the Pennsylvania Railroad. The floor of the quarry varies from 45 to 50 ft. below the river bed.

In 1943 it became necessary for the company to extend its flood protection in order to preserve the acreage acquired for quarrying purposes. In the path of this expansion was a small creek draining an area of 254 acres. The stream entered the stone property through an old masonry culvert under the railroad tracks and ran across the stone land to the river. When quarrying in the stone land within the levee was increased, the stream had to be diverted along the Pennsylvania Railroad to a point beyond the flood control area and thence to the river.

Once the stone had been quarried past a point opposite the old railroad culvert, the work of filling the quarry began. This was done on a line established on the shortest distance from the culvert to the river.



Bed preparation for the tunnel for which 260 lineal feet of 15-ft. diameter pipe was constructed for the narrow-gauge track in the National Lime & Stone Company quarry, Lima, Ohio.

By 1948 the rock had been quarried far enough beyond this line to permit construction of the fill without interference to quarry operations. From then on all the earth overburden removed from the rock within the levee was used in making a fill as high as the top of the original rock.

Along one side of the quarry was a narrow-gauge track over which dump cars hauled the raw stone from the quarry face to the crusher plant. This track had to be kept in service in order to operate the quarry. The fill was built across the quarry and as close to the track as possible without interfering with its operation.

Erection of the pipe for the tunnel at the southern edge of the fill.

Next an alignment was set for the new track, and a trench was excavated 2 ft. deep, 8 ft. wide, and 260 ft. long at the point where the fill would cross the new track. In this trench 8 in. of porous backfill was placed and compacted. The trench was constructed on a grade and connected to a drain in the quarry bottom. Two hundred sixty lineal feet of 15-ft. diameter 1-gauge Armco Multi-Plate pipe was then laid on the compacted trench fill, to serve as a tunnel for the narrow-gauge track upon completion of the fill. The ends of the pipe were cut to a 2:1 slope. Finally the new track was constructed through the 15-ft. pipe on a crushed stone fill 2 to 2½ ft. deep and connected at each end with the old track.

In 1953 the fill was completed from one side of the quarry to the other. A drain pipe was laid across the fill the same year to take the creek flow that was diverted around the levee in 1943. This drainage installation consisted of 840 lineal feet of 60-in. 8-gauge, Armco asbestos-bonded, fully bituminous-coated corrugated metal pipe in 26-ft. lengths. Thirty-three joints were made with watertight connecting bands of 10-gauge metal.

It was essential that the pipe be leak-proof, for leaks could mean interrupted quarry operations that might be very costly. Water running down into the quarry would have to

The completed tunnel and the relocated track, running through the fill.
Right: Topside view looking south toward the Pennsylvania Railroad, showing the end of the 60-in. diameter tunnel liner (right) under the levee (foreground).

be pumped out into the river.

The 60-in. line starts at the Ottawa River with a tide gate at the end to prevent high water from the river backing up through the pipe. The pipe passes through 65 lineal feet of 67¼-inch 12-gauge Armco tunnel liner through the levee. (This was installed to make sure that the levee would be watertight after the pipe was in service.) From the levee the pipe runs across the top of the fill to the Pennsylvania Railroad. through a corrugated metal culvert, and ends on the opposite side of the track.

The 60-in. pipe was laid on a grade of 0.194 percent and can carry 34,700 g.p.m., equivalent to an excess of 31 percent runoff during a storm of one inch of rainfall per hour. The high runoff was arrived at because of the physical nature of the drainage area and because it might become residential property.

Construction was completed with no interruption to quarry operations. The 60-in. storm sewer has now carried away drainage from several storms without a sign of leakage.

Fill across the quarry was laid by Earl Blausey, excavation contractor, Woodville, Ohio. All work was done under the direction of S. H. Friesner, general superintendent, and J. R. Joseph, plant superintendent, both of The National Lime and Stone Company. S. D. Downing, civil engineer, Bowling Green,, Ohio, was responsible for engineering design and supervision.

J. M. Stolle, general foreman of the packing department of the Universal Atlas Cement Company's plant at Hannibal, Mo., recently retired after 44 years of service.

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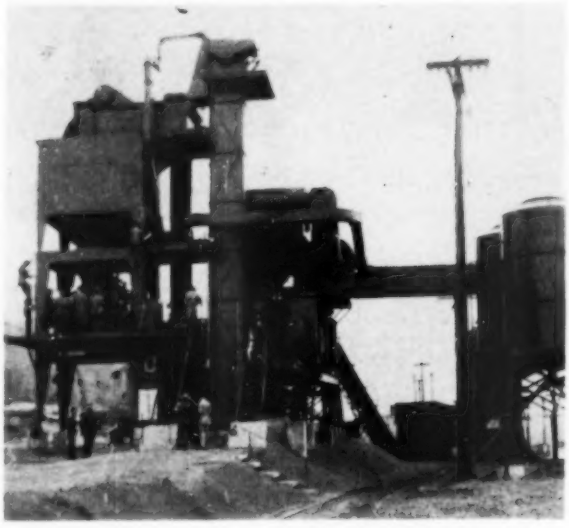
New Haven Trap Rock Company Erects Largest Asphalt Plant in East

WHEN The New Haven Trap Rock Company built its first asphalt plant in Plainville, Conn., it was expected that its capacity and versatility were sufficient for many years. As the area surrounding Hartford has been exposed to the growing needs of a dynamic population, however, the public's demand for more and better roads placed a strain on the capabilities of the plant. The 60-ton-per-hour capacity was not sufficient; and, in order to keep up with these changes, it was obvious that a new plant had become a necessity.

The new plant, a Hetherington & Berner, Model T-60, with a 3-ton pugmill, has many unusual features. One outstanding characteristic of the plant is its ability to produce 3½ tons per minute, or 210 tons per hour. Each unit of the plant is designed to maintain this level of output, and to eliminate bottlenecks. It is possible to produce a mix to meet any specification, another outstanding feature. With six cold feed bins, accurate controls and sufficient flexibility are assured.

These 25-ton-capacity bins are mounted in a line adjacent to the rail track and over a 20-in. by 155-ft. conveyor belt, which feeds the hot-mix plant. The ¾-in. and ½-in. bins discharge to the belt *via* flow gates, whereas reciprocating feeders are used for the ⅜-in. stone and sand bins, and Syntron vibrating feeders for the No. 1 screenings and No. 2 screenings bins.

The dryer, an 88-in. by 30-ft. unit, is rotated by an activated trunnion drive attached to a 75-hp. gearmotor. The tires on the dryer are not welded to the frame but are held in place by metal shims, which allow for differences in rates of expansion of the two bodies and prevent one unit from forcing the other out of shape. The internal flights are welded to the wall of the dryer.



A general view of The New Haven Trap Rock's new 210 t.p.h. bituminous concrete plant at Plainville, Conn., said to be the largest, most modern asphalt plant in the East. The two 10- by 20-ft. scrubbers are located on the right.

At the end of the 66-in. O.D. (54-in. I.D.) by 9-ft. long alamo-lined combustion chamber, there are four 5-in. Hopkins low-pressure burners. When all four burners are operating, there is enough heat to dry all material passing through the dryers and maintain the maximum output at 210 tons per hour. A New York 66-in. blower fan driven by a 100-hp. motor serves as a main exhauster for the dryer.

Bunker C oil is used to heat the dryer and the boiler. The boiler itself is an 80-hp., 125-lb. pressure Cleaver Brooks which furnishes heat to all the asphalt lines as well as the five asphalt storage tanks.

The plant is equipped with a Deister UF 3514 2¾-deck screen driven by a 20-hp. gearmotor; this large screen provides ample screening capacity.

The hot bins consist of four compartments totalling 80 tons. In addition, there is one mineral filler bin which is kept supplied by a separate filler elevator. A Model S-60 mixer driven by a 100-hp. gearmotor mixes 3 to 3½ ton batches.

All electrical controls are centralized in an entirely separate control room. Asphalt control is effected by a 3- by 4-in. fluidometer. The asphalt pump is a 200-g.p.m. Viking 3- by 4-in. unit, powered by a 15-hp. motor. A completely automatic lock-out system controls the operation so that if any one unit fails to operate, each unit behind the faulty section will shut off.

The plant is also equipped with a Quincy compressor and a dust collector served by a New York size 30 blower fan.

Dust is controlled through two 10-ft. dia. by 20-ft. scrubbers located at one side of the plant, as

Left: Another view of the new asphalt plant, showing the 20-in. by 155-ft. belt conveyor feed for conveying raw materials.

Right: A closeup of the six cold feed bins, mounted over the 20-in. belt conveyor.

shown in the photograph. In each scrubber there are two coke beds 4 in. thick, and three of sprays. Water is pumped through the scrubbers at 250 g.p.m. at 50 p.s.i. The waste water is removed from the bottom of the tanks to a settling basin nearby.

Asphaltic material is sold under the company trade-mark "Blue Diamond Mix". In addition to the Plainville plant, The New Haven Trap Rock Company is operating black top plants located at Wallingford, North Branford, and North Haven.

The New Haven Trap Rock Co., reportedly one of the largest producers of trap rock in the United States, has its main office in New Haven, Conn. Officials are as follows: A. L. Worthen, president and general manager; Edward T. Perry, vice-president; Ray J. Reigeluth, treasurer; Robert S. Reigeluth, secretary and assistant treasurer.

Nonmetallic Minerals Show High Volume Increase in 1953

Minnesota Mining & Manufacturing Company reported net sales for 1953 at $219,916,383 ($2.14 per share) compared to the 1952 total of $185,241,760 ($1.96 per share). Net profit for 1953 was $17,997,771, an increase over the 1952 figure of $16,089,995.

Net sales of International Minerals and Chemical Corporation for 1953 were $37,851,753, while the 1952 total was $35,681,713. The 1953 net profit amounted to $2,217,345, as against $1,720,856 in 1952.

For the nine-month period to September 30, 1953, Pennsylvania Glass Sand Corporation's net profit was $1,529,629 ($1.99 per share), while the comparable figures for 1952 were $1,390,326 ($1.97 per share).

Total sales of the Georgia Marble Company for 1953 were $5,194,572; 1952 sales were $4,543,953. Net profit of $416,305 for 1953 topped the 1952 total by $92,759.

General Refractories Company's net sales for 1953 rose to $51,766,834 from $49,945,218 in 1952. Net profit of $4,206,270 ($4.26 per share), however, showed a decline from the previous year's figure — $4,329,852 ($4.38 per share).

Maintenance shops of the J. L. Shiely Company's gravel plant at St. Paul, Minn., were destroyed recently in a $40,000 fire of undetermined origin. The 29-year-old structure was gutted in the blaze, but several highly explosive acetylene tanks used in welding were safely removed.

but also significant

Loads like this have to be handled infrequently but when they are encountered they can't be permitted to stop operations.

If it's an Owen Bucket you can handle such unusual, especially difficult loads without fear of damage to the bucket.

Long experience has taught Owen Engineers where to build in the extra strength in additional material or *special* steel to withstand the abuse to which all buckets are subjected occasionally. That's why they render service for uncommonly long periods with remarkably low repair and maintenance expense.

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Cassiar Asbestos Corp. Reports Big Deposit in B.C.

According to the second annual report of the Cassiar Asbestos Corporation Limited, Vancouver, B. C., exploration of British Columbia's "asbestos mountain" 70 miles south of the Yukon border, has uncovered and estimated 7,000,000 tons of asbestos ore—"enough to supply a 500-ton mill for 40 years."

The mine, on McDame Mountain, near Lower Port, B. C., was described as "one of North America's biggest sources of long-fiber asbestos".

Cassiar, in its report, said it was building a permanent mill to handle 500 tons of ore daily and expected it to be in production by June. A temporary mill, in operation more than a year, has been shipping the product by truck over the Alaska highway.

Superior Portland Cement Doubles Common Shares

A directors' recommendation to double the number of outstanding common-stock shares has been approved by the stockholders of Superior Portland Cement, Inc. This action has brought the company's outstanding shares to 271,708 and the authorized common-stock shares to 350,000. A dividend of 15 cents a share was declared, to be distributed March 10 to stockholders of record February 25. Last year, with half the number of shares outstanding, the dividend was 30 cents.

Superior's president, C. N. Reitze, reported the firm's net income for 1953 was $639,078, or $4.70 a share, compared to $552,092, or $4.06 a share in 1952.

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uniform, low-cost output.

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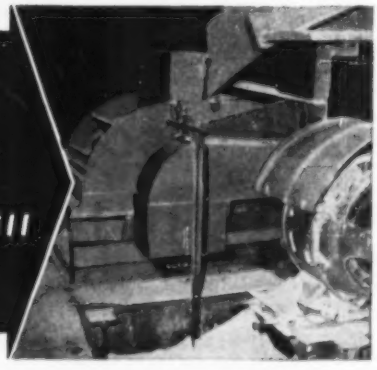
Eagle Crusher's 24x24 hammermill



On-the-job photos, above, show actual results — uniform cubical output — from a hard-working Eagle Hammermill in the heart of the nation's lime stone country.

Especially gratifying is the superintendent's report on this machine: "No downtime in over 4 years."

Send for more information to improve your quality and lower your costs.

EAGLE

JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS

CRUSHER CO., Inc. GALION OHIO·U·S·A

Labor Developments

(*From page 68.*)

with relatively long service, new or liberalized health and welfare plans and increased pensions. In some industries (notably women's apparel manufacture, trade, and transit) the normal work week was reduced with compensating increases in hourly rates."

Thus far in 1954 a continuation of the wide diversity of settlements found in 1953 has been seen, and the wage demands proposed by the major labor unions, which are in themselves diverse, forebode an even greater variety of settlements.

While the Auto Workers, CIO, have to be satisfied with a 5-cents-per-hour annual improvement factor increase negotiated last year, the Electrical Workers, CIO, are asking Westinghouse and General Electric for "substantial" pay boosts, a guaranteed annual wage costing 5 percent of payrolls, a 35-hour week with 40 hours' pay, more holidays, longer vacations, and improvement in the pension and insurance programs.

Many unions faced with increasing unemployment, principally in the meat-packing, textile, and baking industries, are asking for shorter work weeks. With unemployment also rising among construction workers, there is some talk of shorter work weeks in this industry as well.

The bellwether steel industry has also received a large number of demands from the Steel Workers, CIO. Of these, the demand for the guaranteed annual wage is the most dramatic, but the demand for a wage increase and improvements in the pension and social insurance programs appear to be the most serious. The latter is the one the union is likely to win with the greatest ease.

A. L. Penhale, president of Asbestos Corporation, Limited, Toronto, Canada, reported that the firm had a net profit of $4,422,656 in 1953, compared with $4,247,698 in 1952. He added that the value of sales in 1953 set a record despite a drop in volume.

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

WELL DRILLING? You'll get the most out of your wire rope by following the hints in this *MacWhyte* bulletin. (1)

LUBRICATION dates from the Pyramids, this 24-page history of the *Swan-Finch Oil Corp.'s* first 100 years tells. (2)

MOTOR-PUMP selection is covered in this illustrated *Ingersoll-Rand* bulletin, replete with diagrams and valuable data on centrifugals. (3)

WOVEN WIRE SCREENS made by *Simplicity Engr.* are featured in this comprehensive new catalog. (4)

MOBILITY. Semi-dump trailers, mobile crane-mounts and low-bed trailers for all sorts of pit and quarry assignments are shown in this *Talbert* catalog. (5)

PISTON RINGS. Replacement sets for tractors and trucks are described in this *Sealed Power* KromeX literature. (6)

VIBRATING SCREEN operation details and other data fill this 16-page *Universal Vibrating Screen* catalog. Unilec electric units are shown too. (7)

SAND & GRAVEL operators will find valuable this catalog of the *Meckum* line —dredges, cutters, pumps, complete plants, storage facilities, conveyors, etc. (8)

ADD COMFORT and you add safety! Tractors, graders and other equipment can be made more comfortable and safer with *Caterpillar's* enclosed cabs, heaters, lighting systems, track roller guards, etc. (9)

ROCK BOLTING procedures and techniques are shown in this interesting pamphlet from *Ingersoll-Rand.* (10)

PLUG VALVES for application throughout the nonmetallic minerals industry appear in this comprehensive *DeZurik* catalog. (11)

VIBRATING CONVEYORS made by *Hewitt-Robins* are thoroughly described in this 12-page bulletin. (12)

SINTERING lightweight aggregates by the *Dwight-Lloyd* procedure is described in this literature. (13)

LIFE BLOOD of all machinery is proper lubrication, this 36-page *Fiske Bros.* treatise points out, giving applications and recommendations for using Lubriplate. (14)

LOW SPEED DIESELS made in England, described in this *Bamfords* folder, come in one and two cylinder models, 3½ to 16 bhp. (15)

ROLL CRUSHERS for every problem are built "to take it" in long service this *Gruendler* brochure says, giving complete details on the line.

EXCAVATOR. Over a 100 years of engineering are built into the *Osgood-General* model 250-yd., manually controlled crawler-mounted unit. (17)

CONCENTRATING TABLES and related equipment are discussed in this 12-page *Denver* bulletin, with advice, data, etc. (18)

ASPHALT PLANTS tailored to the needs of the aggregates industries are shown in this Iroquois line catalog from *Posey Iron Works.* (19)

TRACTION POWER to "go anywhere" is promised Chevrolet truck owners by *Napco Products,* announcing the Powr-Pak 4-wheel drive. (20)

JOB-PROVED TRAILERS with flat, drop or tilting platforms, 6 to 67 tons, are described in this *LaCrosse* folder. (21)

EXCAVATOR built in Germany by *Demag-Bagger* has diesel or electric drive, one-yard shovel or dragline, and is fully convertible. (22)

ELECTRODE for welding manganese steel in pit and quarry applications is described in this *Alloy Rods* bulletin on Wear-Arc Super WH. (23)

JAW CRUSHERS of the overhead eccentric variety, in sizes from 1016 through 4248, are described in detail in this 48-page *Pioneer* brochure. (24)

BULK TRAILERS for hauling cement, lime, gypsum and other pulverent materials, have integral engines to power the discharge screws, this *Highway Trailer* literature shows. (25)

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THE ONLY one-yard shovel-crane that has power hydraulic control is described in this *Link-Belt Speeder* "98" brochure. **(26)**

COMPRESSORS for portable and/or stationary duties are shown in this bulletin on the *Gordon Smith* line. **(27)**

WIRE ROPE for quarry duty is discussed in this *Bergen* folder. **(28)**

LIME SPREADING trucks built by *Baughman Mfg. Co.* are shown in these leaflets. **(29)**

DRAGLINE bucket chains made of durable Tisco manganese steel are described in this *Taylor-Wharton* bulletin. **(30)**

REPAIRING MANUAL for conveyor belting — 36 helpful fact-filled pages from *B. F. Goodrich*. **(31)**

CIRCULAR SCREENING with the *Sweco* Separator is described in this brochure for plants needing wet or dry screening from coarse to as fine as 325 mesh. **(32)**

PULVERIZED MATERIALS can be transported over the highways in these *Trailmobile* bulk commodities trailers, featuring screw conveyors. **(33)**

WELDOR'S GUIDE. "How to Get Better Welds", a 48-page vest pocket booklet from *Hobart Bros.*, is filled with handy, basic welding information. **(34)**

DIESELS featuring light weight, high hp, eight cylinders, etc. are described in this bulletin on the new *Hercules* line. **(35)**

TESTING SIEVES and other laboratory equipment made by *W. S. Tyler* are shown in this folder. **(36)**

SWING HAMMER rolling ring crushers for medium duty reduction are shown in this *Stedman's Foundry* literature. **(37)**

CONVEYOR BELTING coated with plasticized PVC for resistance to abrasion, aging and fire is described in this *Scandura* brochure. **(38)**

TRACTOR-LOADER. Hydraulic torque converter drive and clutch-type transmission, feature this *Tractomotive* tire-mounted, ¾-yd. unit. **(39)**

ELECTRIC MOTORS of the explosion-proof variety, ½ to 25 hp, are described in this *Allis-Chalmers* folder. **(40)**

BARGES for river and harbor haulage both open and enclosed, are built of welded steel by *Dravo Corp.* as shown in this interesting 28-page treatise. **(41)**

SLINGS and thimbles. This *Leschen* folder shows the new Red-Strand slings and Pin-Lock thimbles. **(42)**

CONVEYOR BELTS made by *Hamilton* are covered in this 30-page catalog. **(43)**

EXCAVATOR. The heavy-duty *Wayne Crane* ½-yd. model or 12½-ton crane has crawler, wheel or truck mounting. **(44)**

BOTTOM DUMPS. Excellent hp-to-weight ratio is claimed for the 17-yd. *Euclid*. It hauls as much as 25.5 yd. (1:1 slope) at speeds to 28-mph. **(45)**

CRANE DRIVE equipment. *General Electric* d-c crane motors, controls and built-in magnetic brake are described in this 12-page bulletin. **(46)**

INTER-COM SYSTEM that uses "sound-powered" telephones—no batteries, outside power or electrical hazards — is described in this *Wheeler* bulletin. **(47)**

"BOSS OF THE CRAWLERS" is what *Caterpillar* calls its new D8, a 150 drawbar hp tractor. It features the new oil clutch. **(48)**

NERVE CENTER for electrical systems—the panelboard is discussed in this planning guide from *Westinghouse*. **(49)**

HIGHWAY GIANTS built by *Autocar* are highlighted in this easy-to-read booklet, showing the many features of these trucks. **(50)**

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"NO QUESTION WHAT POWER I WANTED FOR THIS PLANT"

The significance of Ray Cook's remarks is largely hidden. You can see only one of the two Caterpillar D326 Engines that power the 40" x 40" Cedarapids impact breaker for Ray Cook Construction Co., four miles northeast of Ames, Iowa. Also in view is a Cat® D337 driving a hammermill. Behind the scenes, a D13000 Electric Set furnishes power for three 4' x 12' Iowa screens, a feeder, a 36-inch 100-foot conveyor, three 24-inch conveyors of 95 feet, 50 feet and 10 feet, and two bin-vibrators. In addition, a D8800 powers a compressor for drilling two-inch holes 10 feet into rock in 4½ minutes!

The D8800 in the compressor has about 5000 hours on it. "We've never had a wrench on this engine," says Ray Cook, "except to put in one injector."

Ray Cook bought his new engines on the basis of past Caterpillar performance. He also owns four Cat track-type Tractors. "We've used Cat-built equipment for years and years," he says, "so there wasn't any question what power to buy for *this* plant."

The performance of his Caterpillar-powered plant has justified Ray Cook's faith. The plant produces 150 tons per hour of ag lime, asphalt stone and Class A concrete road stone. In this dusty, ten-hour-a-day work, he particularly likes the long life and low service costs of Caterpillar Diesels. These rugged units are built to deliver without pampering or down time. And their special fuel-injection system means full and foul-free power on money-saving No. 2 furnace oil.

There are 12 sizes of engines and electric sets, to 500 HP and 315 KW. Leading manufacturers of crushers, excavators, compressors and other rock and gravel machinery can furnish Cat Engines as part of their equipment. And, your Caterpillar Dealer can furnish replacement engines and electric sets. See him today—and count on him for fast, skilled service and genuine factory parts.

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Some Problems Associated With Compression Lubrication

AIR COMPRESSOR EXPLOSIONS AND RECEIVER FIRES

IN the previous discussion it was pointed out that excessive lubrication, particularly with unsuitable oils combined with contaminated air and excessive discharge temperatures, could result in the formation of carbonaceous deposits on the discharge valves. These deposits not only impair the action of the valves but if they begin to hold the valve open, the discharge temperature will increase progressively with each stroke of the compressor. If the compressor is not shut down relatively soon after this develops, the discharged air may become hot enough to cause spontaneous ignition of the deposit. With further development of heat, the deposit can become incandescent and under certain conditions may weaken an area in the high-pressure section to cause a rupture or ignite an accumulation of oil mist and vapor in the discharge area.

The occurrence of such accidents is extremely rare; however, the unsound practice of demanding a high flash point oil to prevent them is not so rare. Extensive investigations[2, 3] have been conducted and there has been a general agreement that an oil having the least tendency to form carbon should be used. These investigations have also established the fact that the flash point in the lubricating oil range has no relationship to the occurrence of such accidents.

The flash point of a lubricating oil is merely an indication of the temperature required to vaporize a sufficient amount of oil to form an inflammable mixture with air at atmospheric pressure when exposed to an open flame. Based on vapor pressure determinations made by observing the initial boiling points of oils under reduced pressure, approximately one percent of oil vapor is required. Under higher pressures such as exist in an air compressor considerably higher temperatures would be required to vaporize a sufficient amount of oil to form an inflammable mixture. Therefore, the formation of an inflammable mixture in the discharge side of the compressor is not

[2]U. S. Bureau of Mines *Report of Investigations 4465, June, 1949*, by H. W. Busch, L. B. Berger and H. H. Schrenk.

[3]*Mechanism of Explosions in Compressed Air Pipe Ranges*, by R. Loison, Published by The Safety for Mines Research Establishment Ministry of Fuel and Power, Buxton, England.

Part II

By G. W. FERGUSON

Technical and Research Division
The Texas Company
New York, N.Y.

so much a function of the flash point temperature as the concentration of oil mist from the oil which is continually being scraped off the cylinder walls by the piston rings and discharged through the valves. This is further reason to reduce oil consumption to the minimum required for satisfactory lubrication.

Experimental work[4] has shown that the lower limit of inflammability of an oil mist and air is essentially the same on a weight basis as for the oil in the form of a vapor. For ignition to occur in either the mist or the vapor state, its temperature must be raised well above the spontaneous ignition temperature which for lubricating oils may be from two to three times higher than its flash point.

Further work[5] has shown that there is little or no relationship between flash point temperature and spontaneous ignition temperature, and under less ideal conditions for ignition (i.e., when the rate of heat transfer from the point of ignition to the surrounding atmosphere is relatively high) considerably higher temperatures will be required to ignite the same material. This may be illustrated by Table IV, which shows the variations between flash point, spontaneous ignition, and minimum ignition temperatures for a wide range of lubricating oils. Considering the many thousands of compressors in daily operation and the relatively low number of air compressor explosions and receiver fires,

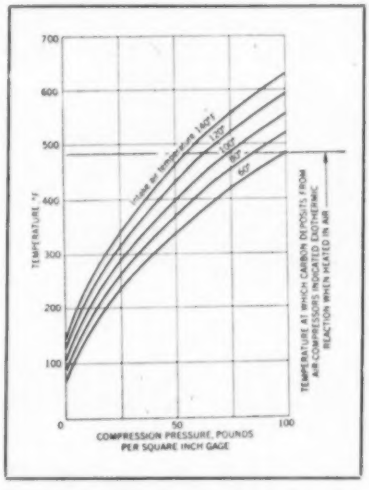
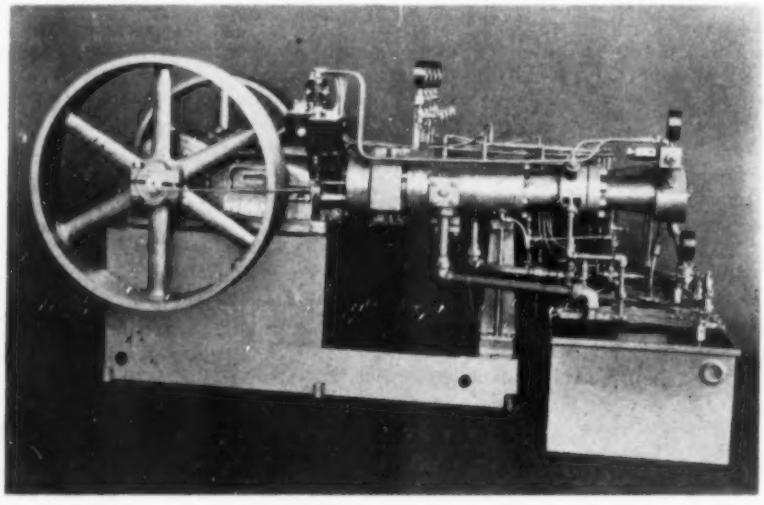


Figure 8 — Relation of temperature of single-stage adiabatic compression to temperature at which carbon deposits from air compressors were found to exhibit exothermic reaction. (From U.S. Bureau of Mines R.I.-4465.)

[4]*Uber Nebelexplosionen (Fog Explosions)* by F. Huber and H. Wolff, Zeitschrift für Angewandte Chemie, Vol. 36, 1923, pp. 373-377.

[5]*Diesel Engine Crankcase Explosion Investigation*, by G. W. Ferguson, Transactions of the American Society of Mechanical Engineers, Vol. 74, 1952, pp. 7-21.

Figure 7 — Multi-stage compressor for pressures up to 25,000 lb. Mechanical lubricator used for cylinders.



these ideal conditions are rarely encountered, and then only under very adverse circumstances.

As a matter of interest, the above-mentioned investigations have shown that actual discharge valve deposits removed from malfunctioning air compressors may become exothermic at temperatures as low as 309 deg. F.[3] Work carried out by the Bureau of Mines[2] indicated the deposits may become exothermic at 482 deg. F. This exothermic reaction temperature may be described as the temperature at which the deposit develops more heat than it can dissipate. When this temperature is reached, the deposit becomes progressively hotter and reaches an incandescent stage. The latter value (482 deg. F.) has been correlated with temperatures developed in similar compressor units in which explosions occurred. As shown in the wide variations in experimental results (from 309 deg. F. to 482 deg. F.), the exothermic reaction temperature will depend on the type of deposit formed and the heat transfer condition existing in the vicinity of the deposit.

Figure 8 illustrates the practical relationship of the exothermic reaction temperature of actual compressor deposits in relation to the calculated temperature of adiabatic single-stage compression with increased pressure and intake air temperature. These curves not only indicate the desirability for limiting discharge temperatures to a safe value but suggest the use of automatic, temperature-actuated shutoff mechanisms to avert possible accidents from operation at abnormally high temperatures. These mechanisms would also be of value in protecting against possible piston seizure and scored cylinders which might be encountered from excessive discharge temperatures or valve failure.

Table IV—Ignition Characteristics of Various Oils

Type of Oil	Flash Point, COC, °F. ASTM D-92	Spontaneous Ignition Temperature, °F., ASTM	Minimum* Ignition Temperature, °F.
Naphthene base oils			
SAE-10	385	755	1500
SAE-30	395	775	1500
SAE-50	425	810	1500
Paraffin base oils			
SAE-10	410	730	1500
SAE-30	490	790	1500
SAE-50	500	795	1500
Heavy-duty oils			
SAE-10	430	710	1500
SAE-30	440	780	1500
SAE-50	465	815	1500
Heavy-duty oil plus			
5% diesel fuel	400	780	1500
10% diesel fuel	300	730	1500
20% diesel fuel	260	735	1500

*Minimum ignition temperatures obtained in explosion tube apparatus using 2-in. x 1-in. x 0.02-in. electrically heated michrome igniter, 250°F. mixture temperature, air flow 1.45 lb. per min.

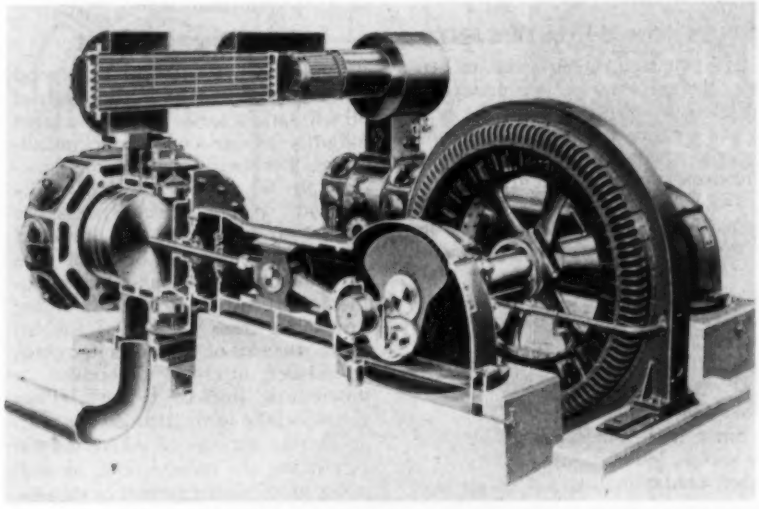


Figure 9 — Duplex, double-acting reciprocating compressor. Cylinders are lubricated from mechanical lubricator and bearings from pressure system.

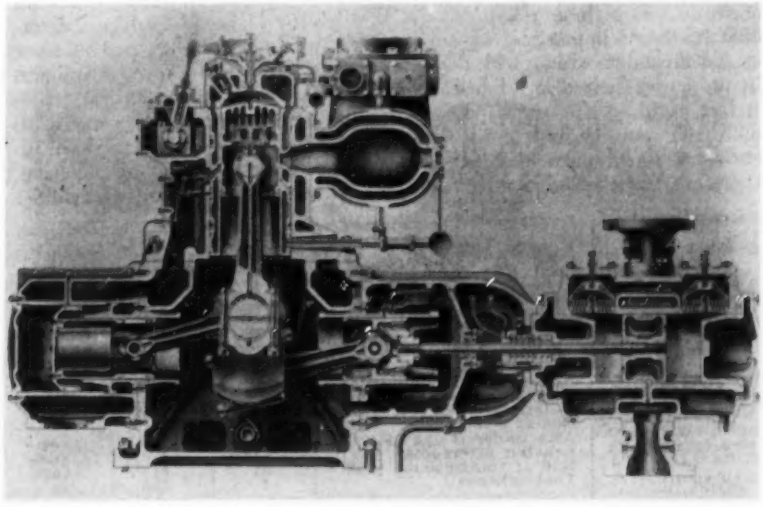


Figure 10 — Cross section of gas-engine-driven compressor unit.

CONDENSATION AND COMPRESSOR COOLING

Water can affect compressor lubrication in several ways. If it condenses on the cylinder walls, it will interfere with lubrication and cause wear. If it is present in any portion of the system, rusting may occur. Rusting, in turn, can result in excessive wear of either the rubbing surfaces of the compressor or connected pneumatic machines. With certain gases such as H_2S the presence of water may also cause serious corrosion difficulties.

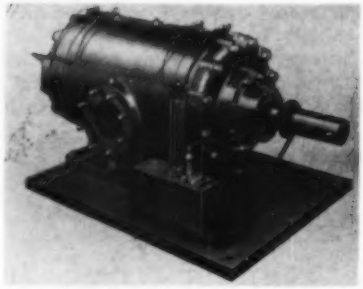
The same five oils previously described were subjected to the A.S.T.M. Rusting Test and the Humidity Cabinet Test, and their rust protection qualities were compared. It will be noted from Table V that the rust- and oxidation-inhibited oil and the detergent oil offer the best rust protection. If good water separation is desired, the inhibited type of oil is preferred. Where water is actually condensing on the cylinder walls, an emulsifi-

able lubricant is needed; and a compounded oil is preferred, although a detergent oil may sometimes be used.

To determine where condensation occurs in a compressed air system, the relative humidity has been calculated at various points. From Table VI it will be noted that beginning with air having a relative humidity of 100 percent, the only place the air becomes saturated in the entire compressed air system is in the aftercooler and in the distribution lines. Thus an emulsifiable oil is seldom needed, except where the compressor cylinder jacket cooling water is considerably below atmospheric temperature, or inter-cooling is insufficient, and supersaturated air reaches the higher stage cylinders. Entrained moisture will adversely affect cylinder lubrication; and the intercoolers, separators, and knock-out drums should be well designed to prevent carryover of liquid particles. In multi-stage machines the cooling water should be circulated first to the intercoolers, then to the low-pressure cylinder, and last to the high-pressure cylinder. To reduce the possibility of condensation, the jacket temperature of the high-pressure cylinder should be at least 15 deg. F. higher than the intercooler temperature.

BEARING LUBRICATION

Compressor bearings are usually lubricated by force-feed or splash systems, although other methods are occasionally employed. As the bearings are usually well designed for the loads encountered and are made of relatively non-corrodable materials, very few lubrication problems are encountered. For most compressors a good grade of straight mineral oil may be used; if possible, the same grade of oil as used for cylinder lubrication. However, the manufacturer's recommendation must be followed in this respect to insure the proper viscosity for the particular machine. Where compressors may be equipped with corrodable-type bearings such as those containing lead either in the alloy form (such as a lead base babbitt) or in the pure state (as in the case of dispersed lead in copper-lead mixtures), the oil should be suitably fortified to protect against corrosion. While bearing corrosion has not been a problem in compressor lubrication, such a possibility cannot be overlooked in the design of new machines. This is a lubrication responsibility of the bearing and compressor manufacturers, together with the oil industry.



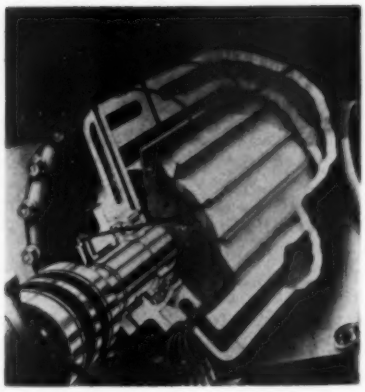


Figure 11 — Sliding vane rotary compressor. Note position of lubricator lines to cylinder and shfat seal. Right: A cutaway view.

SELECTION OF LUBRICANTS

The selection of lubricants to perform the various functions previously outlined will depend upon the type of gas compressed, the type of compressor, and the operating conditions —including pressures and temperatures. These factors have been considered in a careful study of the physical and chemical properties of lubricating oils, as well as of their service performance characteristics. From a practical standpoint, the secret of good lubrication is to maintain a film between rubbing surfaces without impairing their action by the formation of harmful deposits.

Since these films may be affected by speeds, loads, pressures, temperatures, contaminating materials, and reaction with the particular gas being compressed, considerable care should be exercised in selecting compressor lubricants. For these reasons it is difficult, if not impossible, to draw up specifications which will define the properties desired in a lubricant. In fact, rigid specifications may actually rule out the use of superior lubricants for a particular service. Therefore, it is recommended that the purchaser limit such specifications to cover the more important physical characteristics, such as viscosity and pour point, and a description of the particular type of service intended. The following discussion outlines some of the more important considerations given in the selection of compressor lubricants.

AIR COMPRESSORS

Under normal conditions any good grade of power plant oil or industrial oil will satisfactorily lubricate a large majority of air compressor installations. For special applications, however, the oil must be more carefully selected. Where valve deposits are encountered, a straight or inhibited naphthenic oil should be used. The rust- and oxidation-inhibited naphthenic oils are recommended where protection from rusting of the interior surfaces of the air compressor, intercooler, aftercooler, receiver, or distributing lines is desired. They are especially recommended for units in marine service or where humid conditions are encountered, as well as for units in intermittent or standby service. The rust- and oxidation-inhibited oils are also recommended where crankcase oil temperatures are relatively high. Heavy-duty detergent-type oils may be used in some units to provide improved cleanliness and protect against wear and oxidation; however, from a discharge valve deposit standpoint, the straight or inhibited naphthenic oils are preferred.

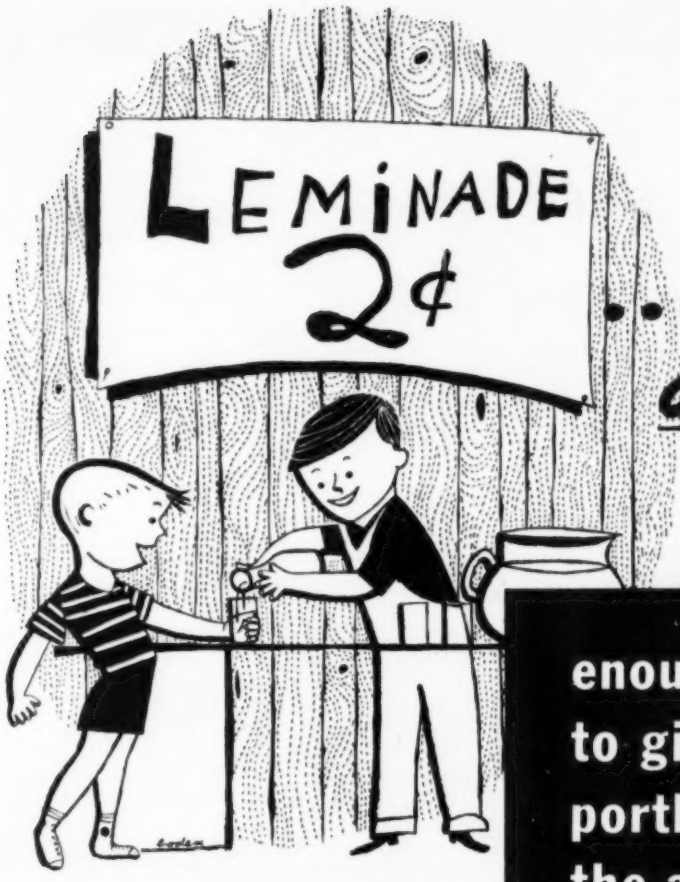
If water is condensing on cylinder

Table V—Water Reaction

Type of Oil	Anti-Rust Rating ASTM D-665	Humidity Cabinet Rating AN-H-31	Emulsifying Tendency
Inhibited naphthene	1	2	Non-emulsifying
Detergent paraffin	2	1	Emulsifiable
Compounded naphthene	3	3	Emulsifiable
Straight paraffin	4	5	Non-emulsifying
Straight naphthene	5	4	Non-emulsifying

Table VI—Condition of Air Passing Through a 100-lb. Single-Stage Air Compressor

	Gauge Pressure p.s.i.	Temperature °F.	Relative Humidity, %
Atmosphere intake	0	65	100
Beginning of compression	0	75	74
15-lb. compressor	15	172	12
End of compression	100	485	1
Aftercooler @ 138° F.	100	138	100
Leaving aftercooler	100	80	100+
End of transmission pipe	97	65	100+
Tool exhaust	0	35	43



...but one cent buys...

enough ERTRANE® C to give a barrel of portland cement all the advantages of air-entraining cement

That's right! Mill superintendents who keep careful records report that to make air-entraining cement Nopco Ertrane C adds less than one cent a barrel to the cost of regular portland cement.

It's true that there are other agents which cost slightly less than Ertrane C—*to start with.* But count in time and labor costs, you'll find that with Ertrane C you're way ahead of any other product.

For, since Ertrane C is a completely water-soluble powder:

1. *You don't pay for freight and storage on water, as with liquid additives.*
2. *You don't have to add other chemicals to dissolve it, as with other powdered additives.*
3. *You don't have to take time out to clean clogged feed nozzles.*

We urge you to try Ertrane C in your own cement, mixed your own way. We'll gladly supply testing samples. Because we know that once you keep cost records on it, you'll air-entrain with Ertrane C from now on. Write today.

NOPCO
EVOLVED THRU RESEARCH

NOPCO

CHEMICAL COMPANY

Harrison, New Jersey

Cedartown, Ga. • Richmond, Calif.

walls, a compounded naphthenic oil, which will emulsify with water, is recommended. Compounded oils are not recommended for crankcase lubrication because of their poor stability and water separation characteristics. Where low starting temperatures are encountered, the high-viscosity-index paraffinic oils should be selected. Where oil-free air is required, such as for food processing, diving operations, or instrument air, the compressor is built either as a non-lubricated unit or as one having suitable oil traps and separators to remove any entrained oil particles. To reduce the possibility of oil vapors being carried over, a straight mineral non-volatile oil of fairly high viscosity may be necessary. The lubrication of high-pressure air compressors may vary considerably with design, and the heavier paraffinic oils are sometimes recommended to provide a satisfactory piston ring and stuffing box seal. However, where valve deposits occur, naphthenic oils should be used for cylinder lubrication.

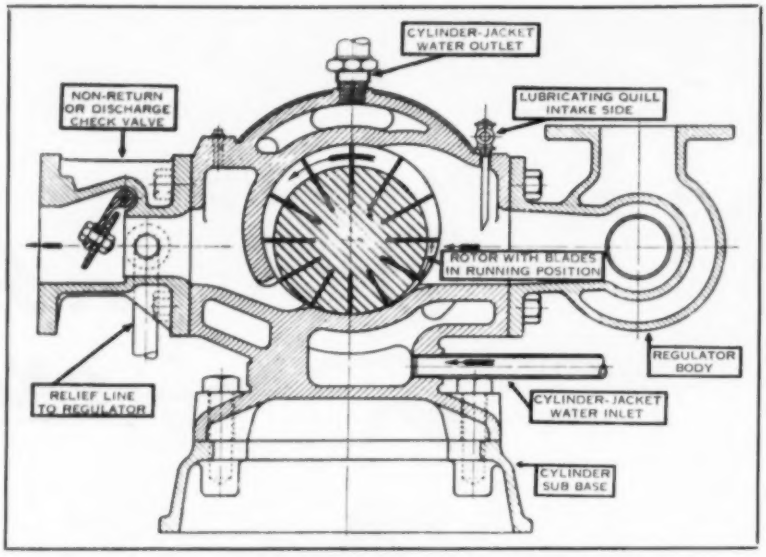


Figure 12 — Sliding vane rotary compressor. Lubricant fed into intake air through lubricating quill.

ROTARY COMPRESSORS

The rotary vane type compressors such as used in many portable-type air compressor units require an oil having sufficient viscosity to prevent

(*Continued on page 124.*)

FACTORS WHICH CONTROL DEPENDABLE COMPRESSOR OPERATION

1. **Adequate installation**—Manufacturers' instruction books provide an excellent guide for the proper installation of the compressor and its auxiliary equipment, in addition to recommended operation, lubrication, and maintenance practices, which should be carefully followed.
2. **Controlled lubrication**—Supply the proper amount of clean oil to lubricate the cylinders, valves, rods, and bearings. Drain and clean the crankcase and lubricators at necessary intervals consistent with operating conditions. Effective lubrication can best be judged by periodically observing the condition of the lubricated surfaces.
3. **Clean Intake Air or Gas**—Filters, scrubbers, knock-out drums, separators, and related equipment should be cleaned and adjusted at frequent intervals to insure that the gas or air entering the compressor is properly cooled and as clean and dry as possible.
4. **Adequate circulation of cooling water or air** insures satisfactory cylinder operating temperatures and efficient performance of intercoolers and aftercoolers. Cylinder temperatures should be sufficiently high to avoid "sweating" or condensation of gases compressed, or from moisture in the intake air.
5. **Efficient intercoolers and aftercoolers**—Maintain these in a clean condition to insure effective cooling of the compressed gas and separation of condensed liquid. Drain receivers, intercoolers, and traps daily. Removal of water and condensed liquid prevents liquid carryover, rusting, and excessive accumulation of oil.
6. **Satisfactory valve operation**—Inspect valves and discharge passages at frequent intervals and clean when necessary.
7. **Periodic inspections of** cylinders, piston assemblies, packing, running gear, and regulating devices will aid in maintaining the compressor in top condition.
8. **Properly selected lubricating oil** provides effective lubrication of friction surfaces and minimizes the formation of objectionable deposits. Storage and dispension equipment should be kept in clean condition and free of moisture, dirt, or other contaminating materials.

FACTORS WHICH MAY REACT AGAINST EFFICIENT COMPRESSOR OPERATION

1. **Excessive vibration and poor alignment** can result in accelerated wear if the compressor is not installed properly.
2. **Excessive oil feed** will lead to formation of objectionable deposits on valves, cooling surfaces, and oil lines. Maintain proper oil level in reservoir and correct oil pressure to bearings.
3. **Compression of dirty air or gas** will cause scoring or abrasion of cylinder walls, piston rings, and valves, and will hasten the formation of deposits.
4. **Dirty or inefficient intercoolers and aftercoolers** will result in excessive discharge gas temperatures and accelerate wear and deposit formation.
5. **Entrained moisture or liquid "slugs"** will seriously affect cylinder lubrication and should be avoided by adequate cooling and maintenance of separators, knock-out drums, intercoolers, etc.
6. **Air leaks or blowby,** due to leaky valves or stuck piston rings, will lower compressor output and materially increase discharge temperatures. Frequent observation of compressor pressures and temperatures is desirable to check for signs of possible malfunctioning.
7. **Knocking or excessive noise** may be due to worn or improperly fitted bearings, a loose flywheel, worn crossheads, a loose piston, insufficient head clearance, deposits in clearance space, or liquid in cylinders. Become accustomed to the sound of the compressor when it is operating normally, since any unusual sounds will often warn the operator of possible trouble.
8. **Careless selection of lubricating oil**—Suitable precautions should be taken to assure that the right oil is used in the right location.

PRECO *Back-Rippers*

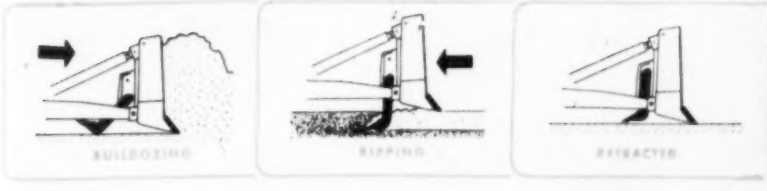
BREAKS UP SHALE WITHOUT BLASTING OR CRUSHING!

Preco Back-Rippers automatically rip as the tractor backs up... then ride on top of the ground as the tractor moves forward. They also can be pinned up out of the way. In addition to stripping operations, they speed up all dozing work — road building and maintenance, pioneering, mining, excavation and for push loading scrapers.

NEW METHOD SPEEDS STRIPPING AT QUARRY OF BASALT ROCK CO., CALIFORNIA

They have eliminated all blasting and primary crushing in stripping shale at the aggregate plant of the Basalt Rock Co., at Napa, California. Preco Back-Rippers, mounted on the reverse side of the moldboard of the Company's Caterpillar D-8 Tractors, do the complete job of breaking up the raw shale into pieces small enough to feed directly into the hammermill. This new method saves the company both time and money. The stripping job is materially speeded up while the company has eliminated the expense of other costly equipment.

SEE YOUR "CATERPILLAR" DEALER *or write us for information*



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Preco Back-Rippers are available for "Caterpillar" models including straight blade, angling blade and U-blade bulldozers.

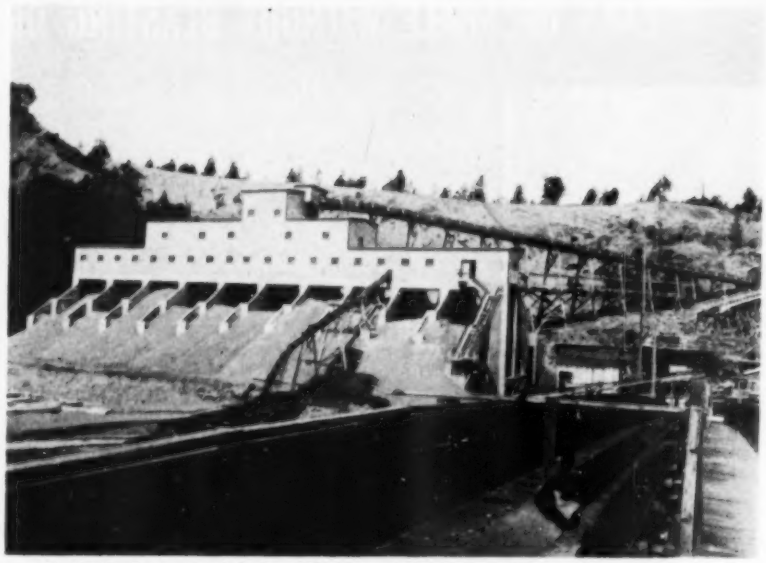
DOUBLE-DUTY CONVEYOR BELT STARS IN TWO-WAY TRANSIT SYSTEM

another ON THE SPOT report

THE most interesting equipment feature in the aggregates plant of Producers Sand & Gravel Company, Ltd., Victoria, B.C., Canada, is the utilization of both sides of one of its conveyor belts to carry materials.

The top surface of the endless 24-in. by 1,150-ft. belt is used to transport finished gravel to storage. Instead of returning *via* idler rolls immediately below, as is customary, at the end of its horizontal run high above the storage piles, the belt plunges vertically about 35 ft. to the far end of the reclaiming tunnel beneath the piles. Returning on troughed carrier rolls, the reverse side of the belt is put to work reclaiming gravel *via* feed gates in the roof of the tunnel. Reclaimed material is tripped off and the belt is brushed clean well ahead of the tail pulley. Very little additional power is required, even when both sides of the belt are at work carrying gravel in both directions, according to Bert W. Parker, superintendent. This belt was designed particularly for this kind of service by Goodyear and the installation has been doing a satisfactory job now for about two years.

By HARRY F. UTLEY



At the Producers Sand & Gravel Company's plant near Victoria, B.C., the washing-and-screening plant building is perched above the concrete bulkheads which separate the finished materials.

"Producers" is a familiar name on Vancouver Island. The concern has been the leading supplier of sand and gravel in and around Victoria for nearly a half-century. The deposit and plant are located on the shore of the Strait of Juan de Fuca, about 7 miles as the crow flies from downtown Victoria, and practically all the finished material is water-borne from the plant by scows.

The original small plant on the site was erected and the pit opened in 1908. These facilities were operated without let-up until five or six years ago when, facing obsolescence, the owners embarked upon a continuing building and re-equipment program destined to improve both operating efficiency and product quality, as well as to increase capacity to a present 225 t.p.h. of washed and sized aggregates. The improvements have been carried out without interrupting operations, having been erected above, around or alongside the old facilities. When a new production unit was completed and ready for service, it was cut into the existing flow-sheet until the entire operation was completely transformed some months ago.

The deposit, believed to be of glacial origin, runs quite uniformly about 60 percent sand and 40 per-

The surplus storage structure is filled by a belt conveyor running on the bridge overhead. The belt returns in a recovery tunnel below ground. Both sides of the belt are thus utilized.

LOOK BELOW the SURFACE...

...AND YOU'LL SEE WHY AN Eagle "SWINTEK" PAYS OFF!

You'll learn how continuous pumping is made possible . . . how some operators have increased production as much as three or four times after installing an EAGLE "Swintek" Traveling Screen Chain Dredging Ladder. In dredging operations the pump is a material handling unit and requires a "Swintek" to insure maximum capacity by screening out oversize and agitating the deposit. "Swinteks" are available in Heavy Duty, Light Duty, and Special Light Duty units—models for every deposit condition. An 8" x 75' Light Duty "Swintek" is pictured above on dredge of Walt Keeler, Wichita, Kansas. Easy to install on any dredge . . . hundreds in successful use . . . low operating and maintenance costs.

EAGLE IRON WORKS 133 Holcomb Ave., Des Moines, Ia.

Three BIG advantages are:

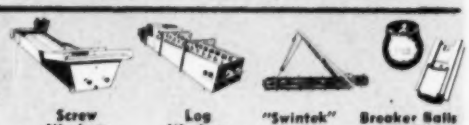
1. Cutters mounted on the traveling screen chain agitate the deposit, cut and rake loose deposit material greatly increasing intake of solids.
2. Traveling Screen Chain screens the suction nozzle . . . keeps out boulders, debris, etc. . . . eliminates costly shutdowns . . . oversize is carried up and dumped away from pumping zone.
3. Cuts through tough clay strata, when encountered, to reach underlying richer gravel. No pump can be expected to penetrate clay strata. "Swintek" cutters hog out clay and carry it away from pumping zone.

KEEPS OUT BOULDERS

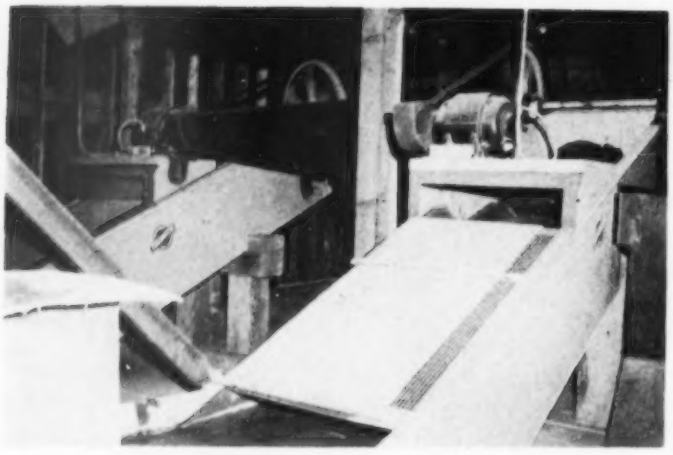
New Catalog 83 graphically tells the complete "Swintek" story—send for YOUR copy. Form 454 describes Eagle All-Steel "Swintek" Equipped Dredges.

EAGLE IRON WORKS

Leaders in Aggregate Washing and Classifying Equipment for a Half Century



Screw Washers | Log Washers | "Swintek" Dredge Ladders | Breaker Balls and Pile Hammers



Final processing and dewatering of the concrete and plaster sands takes place in these two 24-in. by 20-ft. spirals.

Perspective along one of the company-designed sand wash-boxes. Not the hand-controlled spigots projecting from the compartments.

cent gravel. Some silt is encountered, as the seams are troublesome at times; but there is no clay problem to complicate the washing process. A steep bank about 175 ft. in height is worked by an old Marion shovel. This unit, converted to a pull-rake, is operated on the brink of the high face to cave down the material. A Marion 1¼-cu. yd. shovel does the digging on the floor, loading to a portable field hopper which feeds the material to a system of field conveyors. These carry the material to a raw surge pile of 4500 live tons' capacity near the plant.

From the surge storage, a pan-feeder in a tunnel beneath the pile feeds a 24-in. by 400-ft. belt conveyor carrying to a 5- by 10-ft. Telsmith single-deck scalping screen. Plus 2½-in. rejects are passed to a Telsmith 10B gyratory crusher, followed by another screen and a Telsmith 36-in. Gyrasphere crusher in closed circuit to produce three sizes of crushed product—1½ to 1 in.; 1 to ½ in.; and minus ½ in. These may be handled and stored separately or, optionally, they may join the scalping-screen throughs for delivery by a 24-in. by 300-ft. belt conveyor to the washing-and-screening department.

Much of the sizing and cleaning is accomplished by a pair of Telsmith 5- by 10-ft. triple-deck screens generously equipped with sprays. The oncoming material is split-fed to the two identical screens, gravel larger than ½ in. being rejected by the top decks and passed to a Telsmith 3- by 10-ft. 3-deck coarse-material screen.

Six sizes of coarse aggregates within the limits of minus 2½ in. plus ⅜ in. are produced, these dropping to their proper compartment in the storage area below the processing floor.

The sand (minus ¼ in.) passes to two 40-ft. long narrow wooden wash boxes, each divided into five 8-ft. compartments. These were designed and built by the company. Here the sands are cleaned and classified hydraulically, settling and withdrawal rates being regulated by hand-controlled spigots in each compartment. Both plaster and concrete sands are made. Final dewatering is done by a pair of Telsmith 24-in. by 20-ft. spirals.

Concrete bulkheads keep the various sizes of finished material separated in the storage area beneath the washing-and-screening plant; the ten compartments have a combined capacity of around 12,000 tons of gravel and sand. Recovery is by way of two tunnel belts, either or both of which can be used at any time for flexibility. The material may be carried either to (1) truck-loading bins, (2) surplus storage *via* the two-way belt conveyor mentioned at the beginning of this article, or (3) to a scow-loading belt conveyor which juts out into deep water.

The scows can carry from 500 to 700 tons of material. Some of the floating equipment is company-owned but for the most part delivery of product is contracted to the Island Tug & Barge Company, Ltd. Usual destination is the company's waterfront distribution yards in Victoria; or some may go to distant Vancouver. Much of the output is batched for ready-mixed concrete in both cities.

Fresh water for washing purposes is purchased—at relatively high cost—from the Victoria municipal system, and comes to the plant by pipeline. Attempts to drill company wells or to reclaim the used water have been unsuccessful so far because of the intrusion of sea water.

The pier and the conveyor extend into the Strait of Juan de Fuca for loading finished materials into scows.

Factors Influencing the Selection of Modern Rotary Lime Recovery Kilns*

By W. H. TOCK
Application Engineer
Processing Machinery Dept.
Allis-Chalmers Mfg. Co.

Ferris wheel feeder for lime recovery kiln, driven by a 4-speed a.-c. motor and Type 310 speed changer.

PRECIPITATED calcium carbonate, lime sludge, is produced when sulphate green liquor is causticized with lime. The rotary kiln has proved a natural process machine for sulphate pulp mill lime recovery. In the early Kraft mills of much less capacity than present mills, used or new small kilns were employed. These first kilns used were inefficient, uneconomical units and by today's standards would not be considered for new installations. Inefficient as they were, however, they proved their value and showed that a rotary kiln could provide a constant supply of uniform lime. Today rotary lime kilns are an integral part of all modern sulphate pulp mills.

In a few installations in the early days of the Kraft process the multiple hearth furnace was applied to lime recovery. However, the high cost of maintenance and low unit capacity of these furnaces soon led to their abandonment as a lime recovery unit.

As the industry grew, progressive improvements in the design of rotary kiln installations resulted in efficient recovery units. This has been in keeping with the progress and growth of the pulp industry.

Today there are approximately 100 rotary lime recovery kilns in operation in pulp mills in the United States and Canada. These rotary kilns range in size from 6 to 11 ft. in diameter and from 100 to over 300 ft. in length. The installed capacity per kiln ranges from 25 to over 200 tons of kiln product per day. Assuming an average capacity of 75 tons per day per kiln, the total output of 100 kilns would be 7,500 tons of lime per day. It is interesting to note that the sulphate pulp industry now operates more rotary kilns than the commercial lime industry.

In its simplest forms the rotary kiln consists essentially of a refractory-lined, open-end steel plate cylinder inclined from feed end to discharge end and rotated about its longitudinal axis.

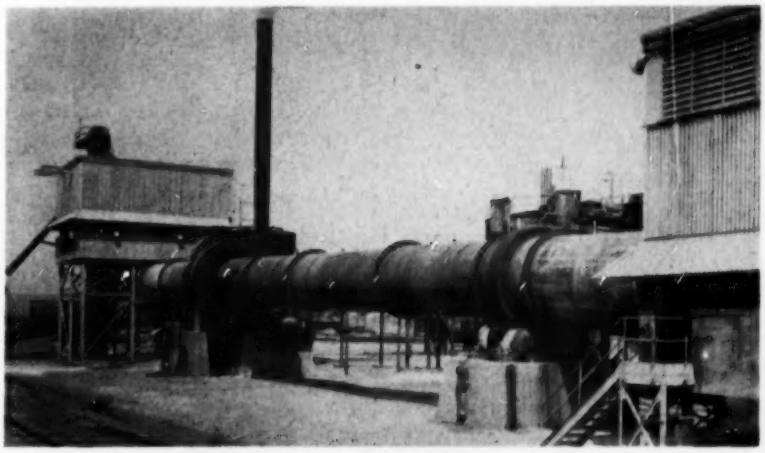
The rotary kiln is supported at two or more points on carrying rollers in rolling contact with kiln riding rings. It is maintained in position by a thrust roller in rolling contact with the beveled edge of the thrust riding ring. The kiln is rotated by a main or girth gear driven by an electric motor through an enclosed-type gear reducer.

Many of the early sulphate pulp mills were installed on the minimum investment for small capacities, and initial cost was of prime consideration.

Probably for these reasons, more than any other, most rotary kilns operating in sulphate pulp mills today are relatively short two-support kilns. These would prove the least expensive initial investment, would operate with the minimum of maintenance, and would be the most flexible in system operation. Today 75 percent of the operating kilns are the two-support type.

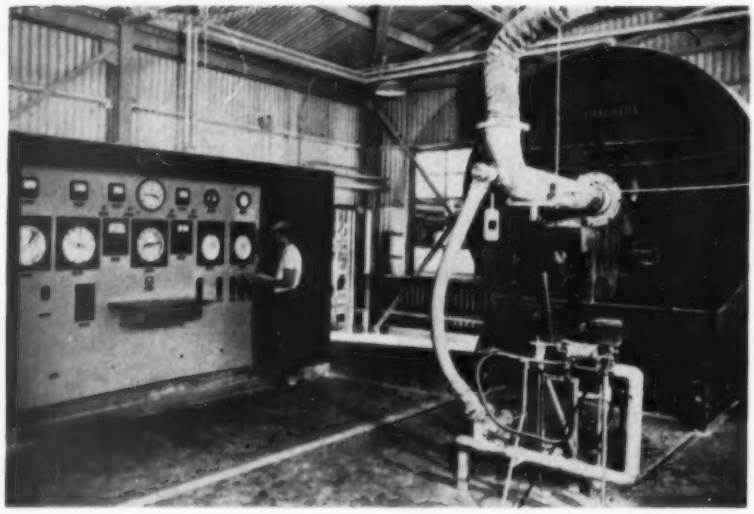
The early kiln installations were usually not too efficient relative to fuel consumption, ranging from 15,000,000 to 25,000,000 B.t.u. required per ton of kiln product. Some kilns today continue to operate in this inefficient range.

About 1935, when more attention was being given to fuel economy, the heat recuperating chain system was developed for use in kilns handling a wet feed such as cement raw-mix slurry and lime sludge.



An 8-ft. 6-in. and 9-ft. by 176-ft. rotary lime sludge kiln.

*Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 18, 1954. Reprinted with permission of *Tappi* (May, 1954).



Firing hood with control panel for a 7- and 8-ft. by 250-ft. rotary lime sludge kiln.

A chain system consists essentially of chain, hangers, and spirals arranged in the feed end of a kiln to extract heat efficiently from the hot gases, usefully transferring this heat to the wet feed. The heat-recuperating chain system has materially increased the efficiency of heat utilization in rotary lime sludge kilns, thereby reducing the fuel required per unit of production.

Most of the kilns installed since 1935 have been equipped with chain systems. Today 65 percent of operating kilns are equipped with heat-recuperating chain systems.

In planning a lime recovery installation it is essential to consider a number of factors which influence both the design and operation. Included among these are optimum capacity and economy of operation.

Typical kilns and nominal capacities are as follows:

Diameter	Length	No. of Supports	Hp.	Capacity Tons Lime (24 Hrs.)
7′	120′	2	15	40
8′	140′	2	30	55
8′6″ and 9′	170′	2	40	75
9′ and 10′	175′	2	50	100
8′	300′	5	60	115
10′ and 11′	175′	2	60	125
9′6″	265′	4	75	150
10′6″	265′	4	100	185
11′	250′	4	100	200
11′	300′	4	125	235

Plant economics dictates the necessity for continuous operation of the lime recovery kiln during pulp mill operation. This is the first consideration in kiln selection.

Plant economics dictates the necesevidence of actual installations, short kilns are used for operations requiring less than 75 tons of lime per day. If longer kilns were used in an attempt to decrease fuel consumption, the diameter would decrease proportionately, with a corresponding decrease in ease of operation.

For operations requiring more than 150 tons of lime per day per kiln, fortunately, large-diameter long kilns can be employed in an attempt to obtain low fuel consumption, with the larger diameters lending themselves to less troublesome operation.

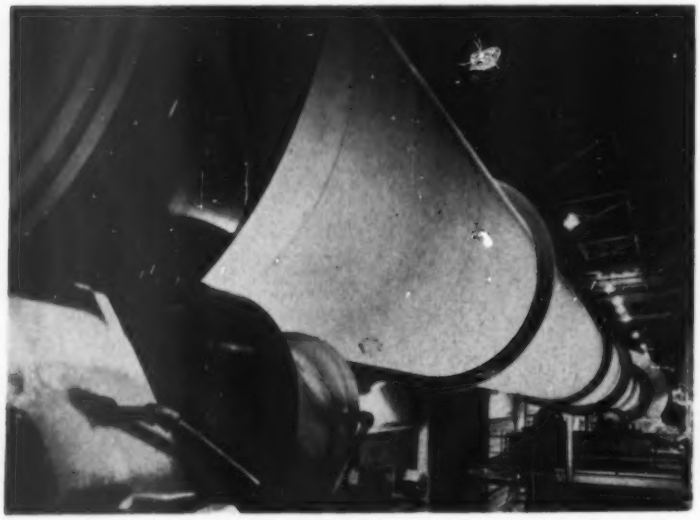
From the table and from the experience of industry we have a choice between a long kiln and a short kiln if operations require a capacity of between 75 and 125 tons of reburned lime per day.

Many operators consider it advantageous to utilize a short two-support kiln of larger diameter rather than a long multiple-support kiln for the same capacity. They consider a short two-support kiln more flexible in system operation and better able to take care of fluctuating demands. They likewise believe that a short two-support kiln will give a greater continuity of operation, being less prone to process operational trouble.

Fuel cost is the greatest single production expense in reburning lime. Therefore, as in other industries utilizing rotary kilns (among them cement and lime), considerable thought is being given to the fuel efficiency possible in long kilns and the effect of that fuel efficiency on the economy of the lime recovery installation as a whole.

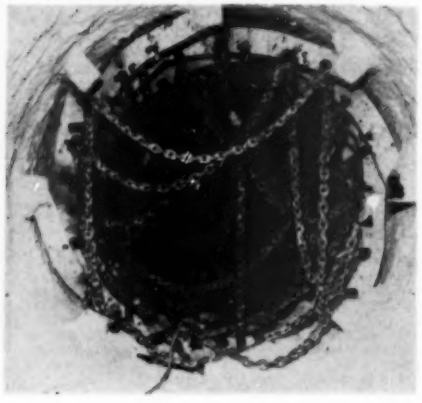
In this respect it would be well to consider what the difference in the cost of production would be between a long small-diameter, multiple-support kiln and a short large-diameter, two-support kiln for the same capacity.

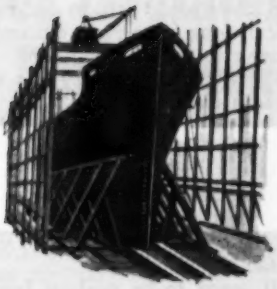
Consider a long multiple-support kiln that can be operated well and continuously with a fuel consumption af approximately 9,000,000 B.t.u. per ton, and consider a short two-support kiln that can be operated well and



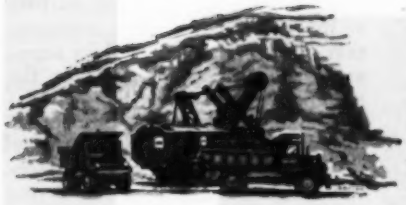
Left: An 8- by 300-ft., 5-support lime sludge kiln equipped with a chain system.

Below: New chains installed in old spirals of a lime sludge kiln.

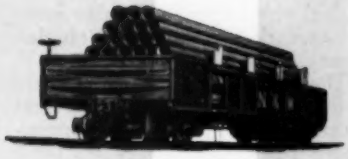




ship builders



quarry operators



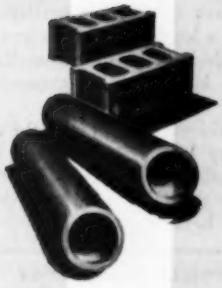
pipe manufacturers

BASALT

in ALL its operations

road builders

uses SHELL ROTELLA OIL exclusively



concrete block manufacturers

Basalt Rock Co., Inc., Napa, California, engages in a wide range of industrial operations . . . all requiring the use of heavy power equipment. Both heavy-duty gasoline and diesel engines are operated by Basalt . . . and Shell Rotella Oil is used exclusively as the crankcase lubricant.

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continuously at a fuel consumption of approximately 9,000,000 B.t.u. per per ton. On the basis of 100 tons of lime per day and present-day costs, there would be a reburning cost of approximately $8.88 per ton of kiln product with the 9,000,000 B.t.u. per ton installation. The 10,500,000 B.t.u. per ton installation would give a reburning cost of approximately $9.15 per ton of kiln product. This cost includes charges for labor, power, fuel, repairs, and such other items as taxes, depreciation, and obsolescence.

The difference in the per ton cost of the two installations, therefore, reflects a difference in cost of approximately 6c per ton of pulp produced.

In making a choice of the kiln installation a value must be placed on the fuel savings of approximately 15 percent in a long kiln. A value must be placed on the savings of approximately 10 percent in the initial cost of a short kiln, compared with that of a long kiln. The saving in fuel cost in a long kiln is sufficient to pay the added costs of the installation of a long kiln in approximately three years.

Considering again that the average capacity per kiln of all the existing kilns installed is 75 tons of kiln product per day, this would mean then a choice between a two-support kiln 8 or 9 ft. in diameter by 170 ft. long and a kiln about 7 ft. in diameter by 300 ft. long for a more efficient kiln relative to fuel consumption.

For 100 tons per day this would mean a choice between a kiln 10 or 11 ft. in diameter by 175 ft. in length and an 8-ft. diameter by 300 ft. kiln.

These capacities and the size and type of kiln which might be selected, therefore, bring up other points to consider in evaluating the kiln to install.

It seems to be evident, from the experience of the industry, that considerable trouble was encountered in early operations of long kilns of 7- and 8-ft. diameter. Usually a period of a year or more was involved before reasonably uniform operation was obtained. During this period it was usually considered necessary to make changes in the control and arrangement of the feed, burning equipment, and instrumentation, along with other revisions in operating procedure.

However, the 8- by 300-ft. kiln has been a popular and efficient size of kiln for wet process cement plants. There it has had an excellent record for dependable operation. There, of course, it is the heart of the process, with the operation of the entire cement plant revolving about it. Operation of all other equipment is established to permit the kiln to perform as it should, continuously producing uniform cement clinker at a constant rate and at an economical fuel consumption, with the minimum of equipment maintenance. Such is balanced operation.

In the pulp mill this type of kiln could be operated, and in some cases actually has been operated, continuously without trouble from start-up at the lowest known fuel consumption. If this type kiln and its accessories could or would be given the attention required for it in installation and operation, it should prove an excellent selection.

Other types of processing are sometimes considered, such as flash drying ahead of an existing kiln to increase capacity, or in conjunction with calcination in a fluidized bed; however, the kiln process continues to be the most feasible to consider.

Of recent consideration, the process of pre-pelletization of lime sludge with subsequent total or partial calcination on a traveling grate appears worth additional investigation. This process equipment can produce lime for approximately half the fuel requirements in the most economical kiln, but the mechanics of handling and the physical characteristics of the sludge and the lime have yet to be investigated.

Compressor Lubrication

(*From page* 116.)

wear and to seal the rubbing surfaces. The oil must also serve as a heat transfer medium to remove the heat of compression. Good water-separating characteristics are also required. Either straight mineral oils or those containing rust and oxidation inhibitors are recommended.

CENTRIFUGAL BLOWERS

The only lubricant required for centrifugal blowers is one for the bearings, which are usually the antifriction type and are usually grease-lubricated. The particular grease selected should be of the highest quality for the type of bearing and service condition.

AXIAL FLOW COMPRESSORS

The bearings are also the principal elements requiring lubrication on the axial flow compressor, and a light-viscosity rust- and oxidation-inhibited oil is preferred.

VACUUM PUMPS

Vacuum pumps are similar in operation to a compressor except that they operate at an intake pressure below atmospheric and discharge at or near atmospheric pressure. Relatively viscous low-volatile paraffin-base oils are usually recommended. These oils have lower evaporation rates and provide an adequate seal to prevent leakage. As the discharge temperatures are somewhat lower than for compressor operation, the naphthenic oils are not required.

In some vacuum pump installations it is desirable to install coolers and water separators to prevent excessive amounts of moisture or liquid from impairing cylinder lubrication. Where moisture is entering the unit but is not condensing on the cylinder walls, a rust- and oxidation-inhibited oil having good water-separation characteristics is preferred. However, where condensation is occurring on the cylinder walls, a compounded oil is desirable to emulsify with the water and provide lubrication. For gases other than air, the heavy-duty detergent oils may provide improved protection against the formation of deposits or corrosive wear; however, the solvent action of the gas may be such that a properly refined straight mineral oil is preferred.

CONCLUSION

Some of the more important problems associated with compressor lubrication have been presented in this discussion. Although the proper selection and application of lubricants play an important part in achieving long periods of trouble-free service, it is equally important that proper attention be given to the design, installation, and operation of compressor units. Because of the many different types of compressors operating under such a wide range of operating conditions and with so many different gases, it is necessary that compressor builders, operators, and lubrication engineers work together to obtain the most efficient, dependable, and economical compressor performance.

Medusa's Sales, Profits Hit All-Time Highs in 1953

The highest peak in net sales in its 61-year history was reached by the Medusa Portland Cement Company last year. The $23,283,472 total rose 15 percent above the previous high record of 1951.

Medusa's earnings also hit a new high at $1,859,735 or $6.73 a share, compared with $1,242,241 or $4.49 a share in 1953.

Chairman J. B. John and President Ellery Sedgwick Jr. stated in the annual report that they expect their plants in northern Ohio will be required to operate at maximum production in 1954 because of their Ohio Turnpike commitment.

Gravel Producer Operates Combined Portable Crushing-Permanent Washing Plant

another P-O exclusive

SEVERAL years ago, C. A. Powley, who does excavating, earth moving, and contract trucking on a large scale in East Peoria, Ill., entered the sand and gravel business, setting up a portable road gravel crushing and screening plant about two miles east of that city. A year later the company (known as the C. A. Powley Sand and Gravel Company) expanded the operation by adding a modern, efficient washing and screening plant having a capacity of 150 t.p.h. Today the plant is operating at full capacity, producing about 20 different sand and gravel sizes, ranging from washed mason and concrete sand to unwashed pit-run gravel.

By KENNETH A. GUTSCHICK

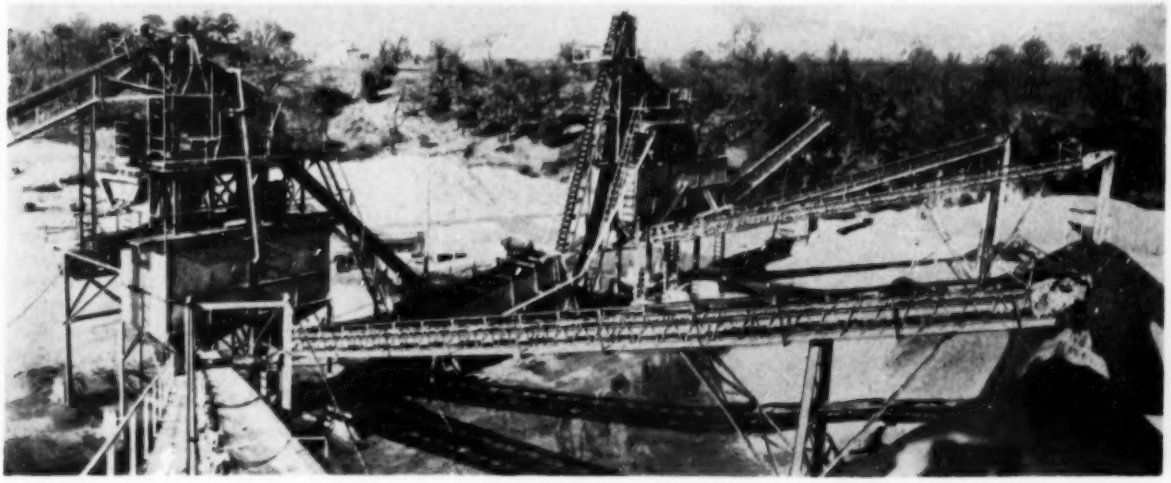
The original portable plant, a Universal Twin Dual Master 24 unit, is still in operation, although it has been converted to a permanent installation. The new washing plant, which immediately follows the Universal plant in the flow sheet, consists of a Simplicity screen operated wet, two Eagle screw classifiers, and a Meckum sand tank—all used on sand production—and an Eagle twin log washer and another Simplicity screen used on gravel production. The washing plant is completely electrified, in contrast to the portable plant, which is powered by a Caterpillar D13000 diesel engine. The operation features the use of stone ladders serving the gravel stockpiles. Truck loading is facilitated by the use of small bins mounted adjacent to the stockpiles.

Material is obtained from a 36-ft. glacial gravel deposit, which is being worked in two benches—one 10 ft. and the other 26 ft. The reason for selective mining is that the upper 10 ft. zone contains an abundance of fines needed in the production of Illinois specification No. 7 road gravel (18 percent passing 40-mesh); the lower bench has a relatively minor amount of fines, but is excellent for other gravel sizes. The material is excavated by a Bucyrus-Erie 15B shovel fitted with a ¾-cu. yd. bucket, loading into a Reo Model 23 and an International K8 truck; loads average 9 tons. In addition, the company loads pit-run gravel sold for fill purposes with two Barber-Greene loaders. Overburden, consisting of 6 to 7 ft. of clay soil, is removed through use of a Bucyrus-Erie 22B dragline and a Link-Belt Speeder LS-85 dragline.

The portable plant, which is used to produce 1½-in. stone and No. 7 road gravel, as well as minus 1⅛-in. material for the crushing plant, consists basically of a Simplicity 3- by 10-ft. 3½-deck screen and three Universal crushers, including a 10- by 24-in. jaw crusher, an 18- by 24-in. primary double roll crusher (fitted with corrugated rolls), and an 18- by 24-in. finish double roll crusher (fitted with one smooth roll, one corrugated). These crushers operate in closed circuit with the 3- by 10-ft. screen.

William E. Carroll, superintendent (left) and C. A. Powley, owner of the sand and gravel firm.

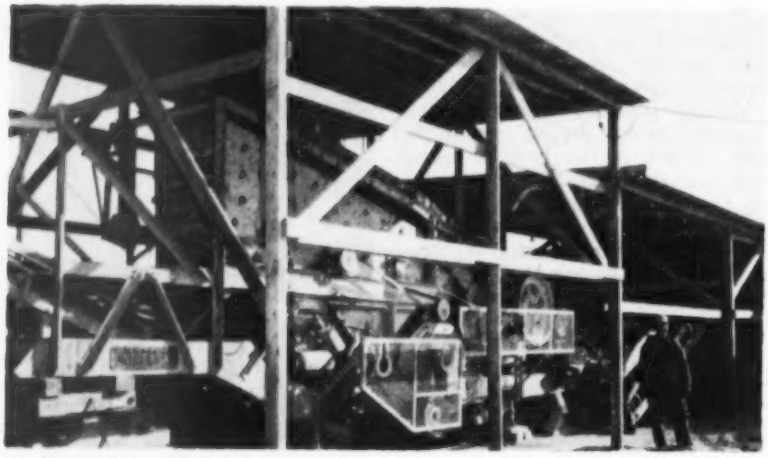
Pit-run gravel is fed to this scalping screen from a 20-ton under-road hopper through a Universal reciprocating feeder and a two-stage belt conveyor. Generally, the screen has 2-, 1½-, and 1⅛-in. openings on its decks respectively. The half deck is used only on No. 7 road gravel production; fitted with ¼- by 1¼-in. slotted wire cloth, it takes out a small percentage of minus 4-mesh material which is then belted to a yard storage bin. The amount of



A general view of the new washing and screening plant of the C. A. Powley Sand and Gravel Company at East Peoria, Ill. The sand producing unit is on the left, the gravel unit on the right. Note the extensive use of stacker belt conveyors and rock ladders.

fines rejected from the half deck is controlled by a swinging gate. Plus 2-in. material from the screen is chuted to the jaw crusher, 1½- to 2-in. material to the primary roll crusher, and 1⅛- to 1½-in. material to the finish roll crusher.

The minus 1⅛-in. material represents finished product or else crusher run product which is fed to the washing plant. When 1½-in. stone is being made on this unit, the 1⅛-in. deck and the finish roll crusher are not used. Production of the crushing plant approximates 200 t.p.h. When road gravel is being produced, the washing plant necessarily is not operated.



Crushing and initial screening is performed on this former portable plant, which has been converted into a stationary unit; it has a 3- by 10-ft. screen, a jaw crusher, and two roll crushers.

A view of the diesel engine drive for the crushing and screening plant.

The 36-ft. gravel deposit is excavated with a ¾-cu. yd. shovel, loading into four-wheeler dump trucks.

One interesting sidelight of the crushing plant concerns the Caterpillar D13000 diesel engine which drives the entire plant. According to Mr. Powley, the unit, which is mounted on a concrete base, has been in operation over 10,000 hours without having required any major overhauling; only two valve adjustments were performed during this time.

Material from the crushing plant can either be chuted to a truck or fed to a 24-in. by 60-ft. radial stacker belt. This belt in turn can deliver the product to a stockpile or to a 24-in. by 68-ft. belt conveyor, which feeds the first unit in the washing plant, a Simplicity 4- by 12-ft. 3-deck screen.

This screen, which is driven by a 20 hp. motor, is fitted with water spray bars. It is mounted over two 50-ton bins, which are used for storage of mason and torpedo (concrete) sand. Normally the screen contains decks having openings of ⅜-in., No. 4 mesh and No. 8 mesh respectively. The function of the top deck is mainly to relieve the load from the middle deck, since all plus 4-mesh gravel is piped directly to the log washer for further processing.

Two Eagle screw classifiers and a Meckum sand tank, fitted with eight valves, operate in circuit with the 4- by 12-ft. screen. One classifier, a 30-in. by 22-ft. unit, produces torpedo sand; the other, a 24-in. by 22-ft. unit, produces mason's sand. Because a certain amount of minus 8-mesh material is needed in the torpedo sand, the two sand sizes are not produced simultaneously. The general practice followed on torpedo sand production is to feed both the minus 4-mesh plus 8-mesh material and the minus 8-mesh material to the 30-in. classifier, the coarser being piped directly to the classifier, the finer being fed through the Meckum sand tank. The latter unit performs an initial washing operation as well as regulating the flow of fines to the classifier.

When mason's sand is being produced, the minus 8-mesh fraction from the screen is fed to the 24-in. classifier *via* the sand tank, while

simultaneously the coarser fraction is piped to the 30-in. classifier; because of the deficiency of fines in the latter product, it is used only for fill purposes rather than as concrete sand. Overflow from the sand tank and the screw classifiers is piped to a sewer.

For the production of washed gravel, the minus 1⅛-in. plus ⅜-in. material from the 4- by 12-ft. screen is piped directly to an Eagle twin 7- by 30-ft. log washer, which is V-belt driven at 35 r.p.m. by a 100 hp. motor. The twin paddles are built of Ni-Hard metal, which according to the firm reduces the wear on the paddles by about one-half compared to using ordinary steel. A 55-ft. open bucket elevator delivers the washed material to a Simplicity 3- by 10-ft. three-deck screen used for sizing gravel. Whereas various sizes of screen cloth are used on the top and middle decks (depending upon the finished products desired), the bottom deck normally is fitted with 8-mesh cloth, the minus 8-mesh material being discharged with the wash water. The finish screen is mounted over three 50-ton steel truck-loading bins, which are used for the finished products.

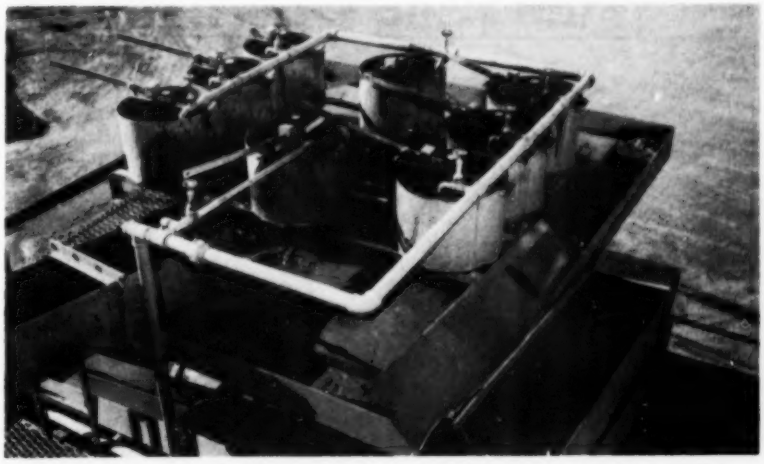
All of the five 50-ton bins in the plant are served by 24-in. stacker belts; four of the units are 80 ft. in length, the fifth (for mason's sand) is 100 ft. long. Each of these conveyors is driven by a 5 hp. motor. The three gravel conveyors discharge to stockpiles *via* 40-ft. stone ladders, which serve to cut down on stone breakage and to prevent segregation.

To facilitate loading from stock-

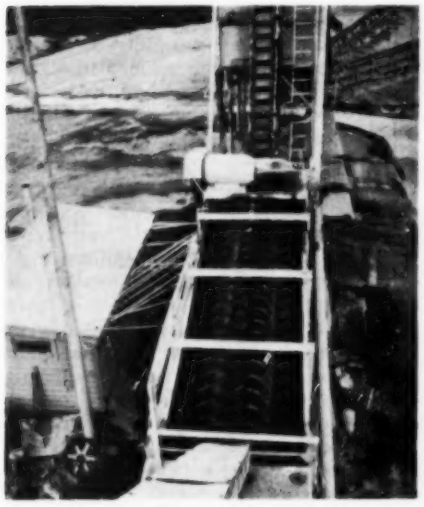
(*Continued on page* 130.)

A view of the 4- by 12-ft. 3-deck screen used in sand production. Water for the washing plant is supplied at 1,100 g.p.m.

This 30-in. by 22-ft. screw classifier produces concrete sand; another classifier (24-in. by 22-ft.) is used for mason's sand.



Discharge to the screw classifiers is via this sand tank, which is fitted with eight valves.



A twin 7- by 30-ft. log washer precedes the 3- by 10-ft. screen used for gravel production; the paddles are made of a nickel-iron alloy which substantially cuts down on wear.

A front-end loader is used for clean-up under the bins. Note the stone ladders in the background, used for gravel stockpiles.

Surface Mining Cable Maintenance

By **STEVE BUNISH**
Mining Cable Engineer
Anaconda Wire & Cable Company

PORTABLE cable construction has undergone many changes and improvements to meet the requirements of modern equipment. Some of the cable manufacturers' best engineers are working continuously for more improvement. Among the materials leading to better cables are high-temperature, long aging rubber insulation, and tough, abrasion-resistant and heat-conducting Neoprene jackets instead of rubber. Improvements in design have included the cord-reinforced jacket, stranding techniques, make-up of grounding conductors and unified mechanical design resulting in improved tensile strength in the cable and greater resistance to damage from excessive tension.

Although they are not new, some previous improvements are important. Among these are a dense, abrasion-resistant smooth jacket for best protection against hard service, continuous brand labeling for complete and permanent cable identification, and the use of synthetic rubber for insulation, instead of natural rubber, for better over-all performance.

Avoid Excessive Tension

An outstanding cause of portable cable failures is excessive longitudinal tension on the cable. Sometimes, despite tension devices on the mining machines, it is possible to get sufficient strain to damage cable jackets and break conductors. Yet warning signs often appear in advance of an actual break, indicating that trouble is on the way.

One good indication of excessive tension is the necking down (or hour-glass shape) of a section of cable, a condition which occurs frequently in smaller sizes.

The story behind "necking down" of the cable is this: When copper conductors are stretched, considerable tension is exerted before any appreciable elongation takes place. By test it has been found that a stranded copper conductor will enlongate 20 percent before rupturing. (Once the conductor stretches, it will not return to its original position.) For this necked-down condition to occur, a cable must have been stretched almost to the breaking point. The tension necessary to bring about the condition is considerable—from 1,500 to 3,000 lb., depending on cable size. Yet, apparently, cable is sometimes subjected to such extraordinary pull. Definite evidence of such excessive tension has been found in No. 4 Awg parallel cables with grounding conductors. The cable has a breaking strength of approximately 3,200 lb.

Another method of determining the degree of tension that has been applied to a cable is to check the lay of the stranded copper conductors. Stranding of copper conductors is a precision operation, and the lay of conductors greatly affects the fatigue resistance and flexibility of a cable. Excessive tension applied to a cable during service lengthens the lay and, in turn, affects fatigue resistance and flexibility in the conductors.

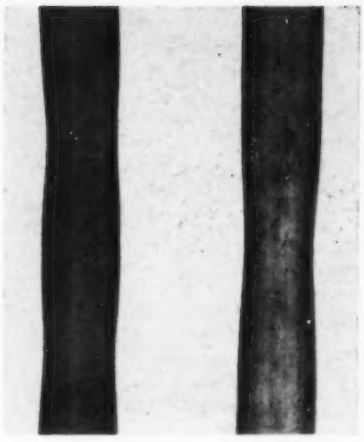
Finally, the protective sheaths of portable cables are much more vulnerable to damage when under mechanical stress. Unfortunately, up to now, standard equipment for abrasion, compression cutting, and other wear-simulating tests for cable jackets is not adapted to applying stress to the test specimen. One simple test, however, demonstrates the difference in cutting strength. Cut through a section of jacket on a cable held straight, then bend an uncut section sharply and cut again (across the cable). The difference is very evident.

Prevent Mechanical Damage

Portable cables are manufactured to extremely rigid diameter toler-

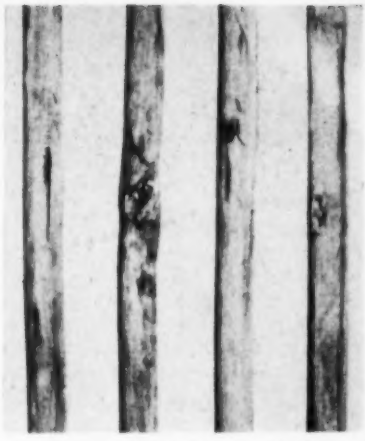
PORTABLE CABLE MAINTENANCE TABLE

Causes of Damage	Evidence of Damage	How to Avoid Damage
Excessive tension	Cable necked down, resembling hour-glass.	Install spring-type shock absorber at power source.
	Jacket creeping back from temporary joint	Keep proper tension on portable reel.
	Grounding conductor pulled in two	
Mechanical damage	Short sections of cable crushed or flattened to a larger diameter	Avoid run-overs.
	Excessive abrasion, cable grooved or showing uneven wear	Replace broken sheaves or broken guides.
	Gouges, cuts, and punctures	Do not pinch cable between equipment and mine or quarry floor.
Current overload	Blistered jacket	Choose cable with an adequate current rating. Consult cable manufacturer or mining-machine manufacturer for recommendations.
	Hardening and cracking of jacket on bottom layer of cable on reel	When cable is removed for permanent splices, reverse cable ends.
	Tinned copper conductor wires turning blue-black	When operating only a short distance from the power source, remove cable from reel and place where it will be well ventilated.
Temporary splices and terminations	Bare conductors exposed in temporary splice	Carry insulating tapes back over original conductor insulation, and replace temporary with permanent splices as soon as possible.
	Open ground conductor	Connect grounding wire in all joints and terminations.
	Kinked cable	Balance the conductors in all joints and terminations so that there will be an even stress on all conductors.



Excessive tension, shown by necking down in "hour-glass" shape, indicates that the cable was stretched.

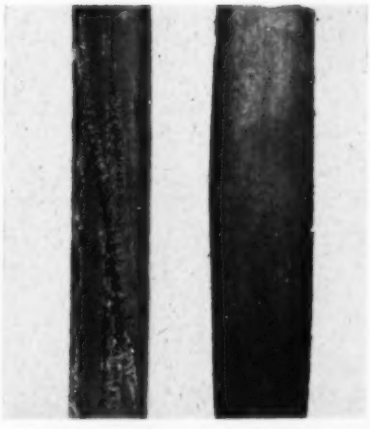
Crushing has occurred to such an extent that diameter variation is seen. This cable was run over or pinched.



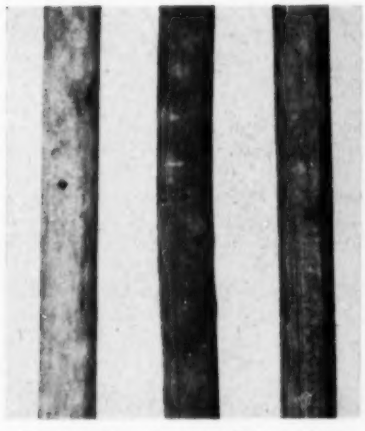
Cutting and crushing have resulted in severe damage. The second specimen from the left was almost severed.

Ten Ways to Mistreat Your Cable

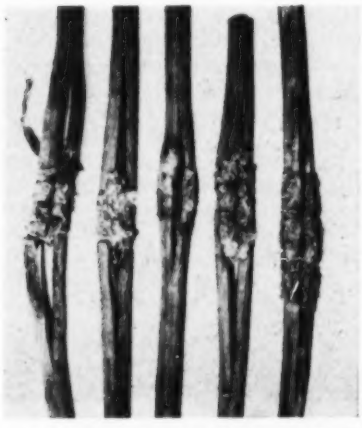
Snagged and torn jacket can go undetected for some time because the conductors are still separated.



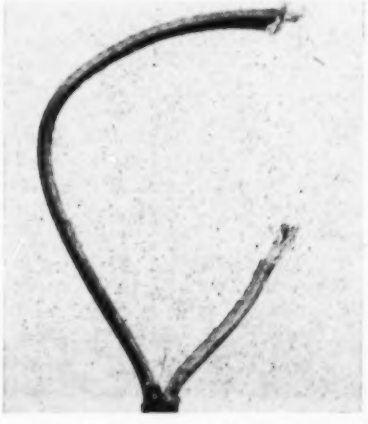
Excessive abrasion (left) has damaged the jacket. Overload is evidenced by the formation of blisters (right).



Punctures have damaged all three of these trailing cables. In wet sections electrical failure would result.



Poorly-taped temporary joints permit water to enter. Tape should be carried over original insulation.



Poor termination, with unconnected grounding conductor is shown here. Conductors should be equal in length.

Poor temporary repairs and joints mean trouble. Ground conductors sometimes are cut and left open.

ances; and without the aid of a micrometer it would be difficult to detect any variation. Therefore, if a cable section shows any noticeable diameter variation or flattening, it could only have happened because the cable was subjected to crushing or compression. The cable may have been crushed in one of several ways, such as running over the cable with mining equipment, or pinching the portable cable between the frame of a portable machine and the mine or quarry floor. The latter kind of mechanical damage can be severe; often it will cut a cable almost in two.

The extent of damage resulting from crushing is not always immediately evident, especially when the cable is used in a dry location. The insulation and the jacket may contain initial breaks that leave an opening from the conductor to the outside of the cable. Electrical failure will not occur because there still is an effective separation between the conductors or an outside ground. When the same cable is taken into a wet location, however, trouble is encountered.

Whenever a portable cable in service is grooved, shows uneven wear, or is abraded deeply in localized sections, it is a good indication that the cable has sustained mechanical damage under conditions beyond those for which it was designed.

Reduce Current Overload

The following are conditions that can be expected when a portable cable is subjected to high current overloads and resulting elevated temperatures:

1. The resistance of the copper conductor is increased, the voltage drop in the cable is increased, and a reduced voltage is supplied the machine, which automatically calls for more current and more heating.

2. Rubber insulation and jackets are more vulnerable to physical damage, such as cuts and tears.

3. Under extreme conditions (stalled motors), the copper conductors can be overheated to the point which makes the entire cable a fire hazard. It must be remembered that even metals will burn at sufficiently high temperatures. The neoprene sheaths on mine-trailing cables have excellent resistance to flame over a wide range of temperatures, but it is possible to generate damaging temperatures under certain conditions. Cables can be electrically overloaded by the following: (a) too small a conductor; (b) operating at low voltage or excessive cable lengths; (c) decrease in cable rating because of the number of layers on the cable reel; (d) inadequate or nonoperating overload protection.

The most likely location to look for the effects of current overload is the section of cable remaining on the cable reel. Evidences of overload might be any of the following:

1. Badly discolored conductors. At moderately high temperatures, tin coatings on copper will acquire a yellow-gold cast; at higher temperatures such coatings have a dull blue cast.

Brittle or very soft conductors. When synthetic rubber compounds have been heated excessively for long periods, they tend to become hard and brittle. Natural rubber compounds tend to soften and become plastic.

3. Blisters between protective sheaths and cable core. Excessive temperatures generate gases which, restrained by the cable sheath, form gas pockets under considerable pressure.

Current rating for cable is based on one cable in the air, with nothing near it to prevent removal of heat by the natural movement of air adjacent to its surface. When a cable is wound on a reel, even in one layer, it can no longer depend upon full natural ventilation. Consequently, heat is not removed rapidly, and current rating must be reduced to prevent damage to the cable. Corrected values for cables on gathering reels are as follows:

No. Layers on Reel	Correct Value (Rated Value × Factor)
1	0.85
2	0.65
3	0.45
4	0.35

Avoid Poor Joints and Terminations

Poorly made joints and terminations will lessen the electrical efficiency of a cable. They can become a hazard to operating personnel. Some of the most common examples of poor splicing techniques in making temporary splices are these:

1. Cutting out the grounding conductors, leaving an open ground.

2. Failure to cover the conductor completely with insulated tapes, leaving bare wires exposed.

3. Failure to balance the length of spliced conductors so that there is even tension on all conductors.

4. Cutting or breaking individual wires during splicing operations.

The following are three good "rules" that cable-maintenance men might follow to prevent the conditions mentioned above:

1. The grounding connector at the terminal ends of a portable cable should always be connected. Failure to do so defeats the purpose of the grounding conductor.

2. To prevent cables from kinking, the conductors at the terminal ends should be of equal length, or they should be so attached that there will be even tension on all conductors.

3. Finally, permanent vulcanized splices should replace temporary ones at the earliest opportunity.

Powley Sand & Gravel Co.

(*From page* 127.)

piles, the Powley firm has installed a 30-ton steel hopper at each stockpile. A Lorain Motocrane and two Hough HM Payloaders are used in loading from stockpile; one of the Payloaders has loaded as much as 2,000 tons in a 10-hour period. Of the 20 different sizes of material produced by the company, three (pit-run, No. 7 road gravel, and 1½-in.) are unwashed. The other (washed) products range from 1-in. gravel to mason's sand. One unique product is concrete-mix (1-in. to 8-mesh), which is made by feeding all the plus 8-mesh material from the 4- by 12-ft. screen mentioned earlier to the 30-in. screw classifier. There is considerable demand for this product (especially from Saturday "do-it-yourself" customers) because fine and coarse concrete aggregates are already blended.

C. A. Powley is owner of the firm; William E. Carroll is superintendent; Dale Riggens is office manager; and Robert Harbers is dispatcher. The washing plant was designed by Universal Engineering Corporation in collaboration with Mr. Carroll. Annual production of the plant approximates 250,000 tons. All of the material is delivered by truck. For this purpose and for contracting, the Powley firm operates a fleet of 25 dump trucks, nine of which are tandem-axle units. The water supply used in the washing plant is obtained from the company's 205-ft. well; the pump is an 8-in. 1,100 g.p.m. Fairbanks Morse turbine unit, powered by a 100 hp. motor.

A contract for $198,360 for surfacing approximately 183 miles of secondary roads in Pottawattamie County, Iowa, with maintenance crushed stone was awarded recently to the Missouri Valley Limestone Company, Des Moines.

personal mention

J. M. Barnhart

JOHN M. BARNHART has been appointed executive director of the Industrial Mineral Fiber Institute, Inc. The appointment was announced by Frank Christenson, president of the association of manufacturers of mineral wool insulation in the United States and Canada.

Mr. Barnhart was most recently with Western Electric Company in New York City and was previously engaged in power plant design for the New York Central Railroad. He has also taught various engineering subjects at Rensselaer Polytechnic Institute. His headquarters are in the Institute offices at 441 Lexington Avenue, New York, N.Y.

New appointments and a revised plan of organization for The Davison Chemical Corporation's research and development division are announced by DR. P. W. BACHMAN, vice-president in charge of the division.

DR. P. L. VELTMAN has been advanced to director of research and development from manager of the Curtis Bay (Baltimore) laboratories. RALPH E. HOPE, formerly manager of research engineering, has been made an assistant director, his duties including management of the laboratories. L. L. BARAL has succeeded him as manager of research engineering. W. K. O'LOUGHLIN has also been named an assistant director. He was formerly manager of the development department, in which position he is succeeded by O. D. MYRICK.

EDWIN M. GLOCKER, formerly staff assistant to Dr. Bachman, has been made manager of the research statistics department, a new post. LUTHER O. YOUNG is manager of the application research department, another new position.

The appointment of DR. ROBERT D. HUNTOON as associate director for physics was recently announced by Dr. A. V. Astin, director of the National Bureau of Standards. The Bureau's organization now provides for four associate directors. In addition to Dr. Huntoon, DR. WALLACE R. BRODE, formerly associate director for research, is now associate director for chemistry; DR. A. T. MCPHERSON continues as associate director for testing; and NICHOLAS E. GOLOVIN, formerly assistant director, is now associate director for administration.

A retirement and two related promotions within the executive sales organization of Universal Atlas Cement Company were announced recently by Fred T. Wiggins, vice-president (commercial) of this U. S. Steel subsidiary.

L. V. Walsh

F. L. Wagner

ALBERT O. STARK, for the last 17 years vice-president, sales, eastern and southern region, retired on April 30 after 48 years of continuous service with the company. Elected by directors of Universal Atlas to succeed Mr. Stark, effective May 1, is FRED L. WAGNER, sales manager of the company's Pittsburgh territory for the last seven years. Successor to Mr. Wagner in the sales management post at Pittsburgh is LOUIS V. WALSH.

Mr. Stark started work with the company at New York as office boy in 1906 and rose through the sales department to become export manager in 1912. In this capacity he traveled extensively throughout Mexico, South and Central America and Europe, establishing sales agencies in those areas. Subsequently, while continuing his responsibilities for export activities, Mr. Stark advanced through successive sales management promotions until 1937, when he was elected to the vice-presidency.

Mr. Wagner, has been associated with Universal Atlas since 1916. In 1921 he became a salesman for the southern West Virginia territory, and for over 20 years he was the company's sales representative in various other territories. He was appointed assistant sales manager in July of 1947 and then sales manager.

Mr. Walsh, successor to Mr. Wagner, joined Universal Atlas at Pittsburgh as a salesman in 1925, and brings to his new post nearly 30 years of experience in the cement industry.

GORDON TUCKER, formerly manager of the Southern Pacific Milling Company's Sisquoc rock plant, has been promoted to the post of general manager of operations in the Santa Maria, Calif., district. He will supervise Southern Pacific Milling plants producing crushed rock, asphalt, and ready-mixed concrete.

At the same time EDDIE LUDWICK, who was previously manager of the firm's lumber division Paso Robles, was appointed general manager of aggregates operations. He will head the Paso Robles crushed rock and ready-mixed concrete plants. There will be no changes in present plant personnel.

Two promotions in the sales organization of Universal Atlas Cement Company were announced by James C. McClure, vice-president and general sales manager of this U. S. Steel subsidiary.

Effective April 1, ELMER C. MARTIN was appointed assistant to Mr. McClure, and HARRY T. SWANSON was named manager of the Atlas White Cement Bureau, succeeding Mr. Martin.

Mr. Martin joined Universal Atlas in 1926 and rose through a succession of promotions until 1947, when he was appointed manager of the company's Atlas White Cement Bureau.

Mr. Swanson joined the company in New York in 1948. In 1950 he was assigned to field duty as a full-fledged technical service engineer, with headquarters at Philadelphia. He held this position until his present promotion.

CALVIN L. DICKINSON has been appointed advisory engineer of the American Potash & Chemical Corporation's Trona, Calif., plant. He was formerly plant manager of organic chemicals division of Diamond Alkali Company at Houston. FRANK A. JESSUP was appointed safety engineer at the same plant.

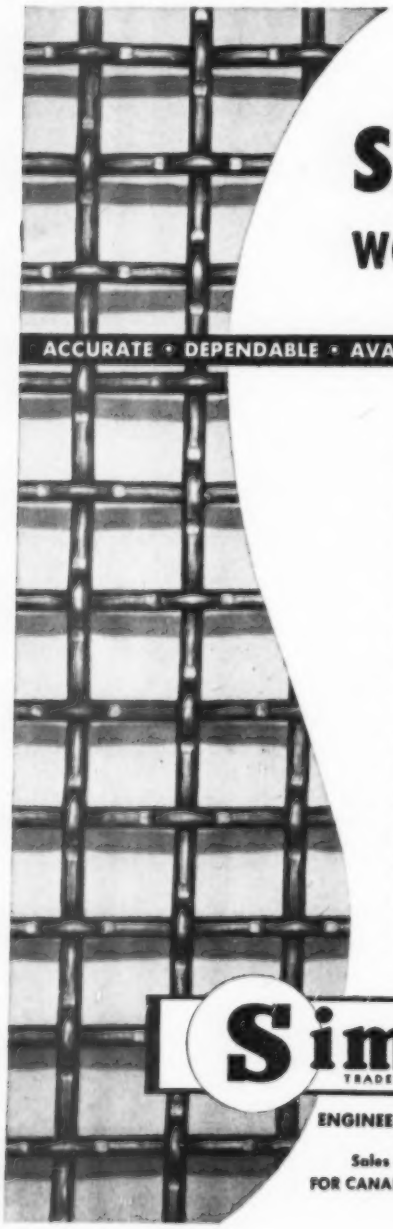
BILL C. WAISTE has been named sales representative in the Yakima, Washington, area for Kaiser Gypsum Company Inc., according to an announcement released by Walter E. Lord, northwest sales manager.

The addition to the sales staff is a part of the company's current sales and production expansion program in the Pacific Northwest, which includes a new $4,000,000 gypsum board plant and plaster mill.

J. SINCLAIR MARKS, assistant treasurer of The Davison Chemical Corporation, has been elected treasurer to succeed J. EARLY HARDESTY, who resigned recently, it was announced by the company. RAYMOND S. CLARK, counsel of the company, at the same time was elected assistant secretary.

Mr. Marks is a member of the accounting faculty at Johns Hopkins. He has been employed in various production and financial capacities with Davison and its predecessor companies since 1929.

JOHN W. POLK was recently named district manager for the northern Illinois district of United States Gypsum Company. He has been with U. S. Gypsum since 1945.



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Obituaries

ABRAHAM B. CROWN, a plant manager for the Material Service Corporation, Chicago, Ill., died recently, apparently of a heart attack, in the company's storage yard. He was found near his car and taken to a hospital, but was pronounced dead upon arrival. Mr. Crown was a cousin of Henry and Irving Crown, chairman and executive vice-president, respectively, of Material Service Corp. He was 69 years old.

CHARLES P. MITCHELL, 73, former superintendent of the Monarch Cement Company at Humboldt, Kans., died recently in that city. When he retired from his duties in 1947, Mr. Mitchell had served the company for 30 years as superintendent of the district office.

WILLIAM HAPPE, 71, owner of the Happe Sand plant, Muncie, Mo., died on February 24 of a heart attack. Mr. Happe had operated his plant in Muncie for 18 years. Previously he had held a partnership in a Topeka sand plant.

GUY SCOTT LAFORGE, superintendent of the Lehigh-Portland Cement Company's plant at Union Bridge, Md., until his retirement in 1946, died on February 10 at University Hospital, Baltimore.

MISS OLIVE M. LEECH, Triangle Construction Company, Fairfield, Iowa, who was associated with John Stout in the limestone quarrying business, was the victim of a fatal automobile accident in which her car was involved. Miss Leech was a member of the Iowa Agricultural Limestone Association.

JOHN BOYD, 57, an employee of the Harbison-Walker Refractories in Vandalia, Mo., for 30 years, died on March 7 at a St. Louis hospital.

HAROLD M. SCOTT, 65, executive committee chairman and retired president of the Keystone Portland Cement Company of Philadelphia, Pa., died at his home on April 7. Mr. Scott, who spent his entire business life in the portland cement business, had been employed by the Lehigh Portland Cement Company, the Edison Portland Cement Company, and the Atlas Cement Company prior to joining Keystone as president and

director in 1930. He retired from the presidency in 1950.

GEORGE J. TROMBOLD SR., president of the Reid Supply Company of Wichita, Kans., died after a short illness recently. Mr. Trombold, an industrial chemist, formerly had been superintendent at the Ash Grove Lime & Portland Cement Co., as well as the Monarch Cement Co. at Humboldt, and general manager at the Wabash Portland Cement Co. at Stroh, Ind. He was 66 years of age.

GEORGE CAROW, chief engineer for the Campbell Limestone Co. at Easley, S. C., succumbed to a heart attack at the age of 61 on April 7.

JAMES W. MCGRATH, 71, president of the McGrath Sand and Gravel Company, Lincoln, Ill., died at his home on April 24 of a heart attack. Mr. McGrath was a pioneer in the sand and gravel business and with two brothers established plants at Mackinaw, Pekin, Chillicothe, Peoria, Bloomington and Forreston, Ill.

ALBERT A. HOFFMAN, a vice-president and a member of the board of directors of the Calaveras Cement Company, San Francisco, died in Oakland, Calif., on May 4, after a protracted illness. He joined the firm in 1944 as a consulting engineer.

Mr. Hoffman studied mining engineering at the University of Kansas and then became associated in managerial positions with copper mining enterprises in Chile. He was a Captain of U. S. Army Ordnance in World War I. From 1936 to 1941 Mr. Hoffman was California manager of the American Potash and Chemical Corporation and president of the Trona Railway Company. He was general manager of the Nicaro Nickel Company of New York and Cuba in 1942 and 1943, leaving that position to become manager of the Las Vegas, Nev., plant of the Manganese Ore Company until 1944.

Mr. Hoffman was a member of the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, and the American Ordnance Association.

FRANK J. GLANKLER SR., vice-president and general counsel for the Fischer Lime and Cement Company, Memphis, Tenn., and prominent attorney and business executive, died on January 3 after a long illness. Mr. Glankler was a former president of the Memphis and Shelby Bar Association, of which he had been a member since 1915.

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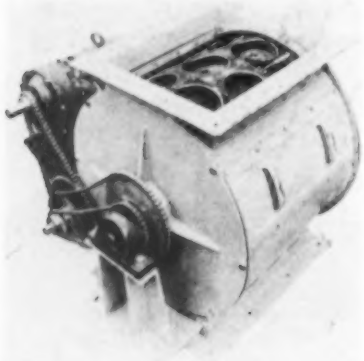
JOHNS-MANVILLE JM PRODUCTS

New Machinery and Equipment

(For more information, use card on p. 109)

• Pocket Feeder

Developed for handling particularly sticky or flushy materials, a new *Richardson* rotary feeder has 36 rubber pockets that increase and decrease in volume when charging and discharging, sucking in the material and urging it out in the manner of a positive displacement pump.



Outputs range from 300 to 1000 cfh. Attached to the bottom of a bin, the feeder delivers a uniform flow, runs silently, is self-cleaning and completely self-contained, and has a rugged design with no delicate parts. Top and bottom openings are 15x19-in. Pockets have a 5-in. diameter; are made of special rubber compound.

Circle No. 51

• Unique Electrode

Beginners and experienced welders alike can get the advantages of manganese-nickel steel weld deposits without any special application technique, *Stulz-Sickles* says, announcing a new Flo-Kote a.c.-d.c. electrode. The 11-13 percent Mn-Ni electrode runs as easily as any stainless or mild steel electrode, welds in all positions, requires no peening, and its weldments can be cut with an ordinary oxy-acetylene flame.

Circle No. 52

• Ni-Hard Drop Balls

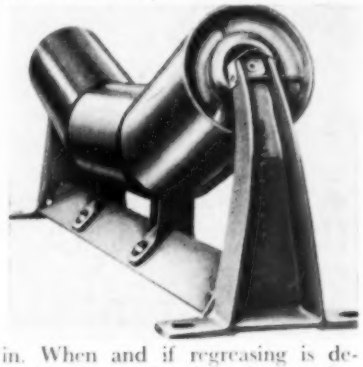
Breaker balls normally furnished in special semi-steel can now be had made of Ni-Hard abrasion-resistant nickel-chromium iron. Ni-Hard balls have given outstanding service in slag and quarry work, *Eagle Iron*

Works says. They are said to have high hardness, freedom from brittleness, less spalling tendency, and less bounce on impact. Pear shaped balls are made in standard 1500, 2000, 3000, 4000 and 6500 lb. sizes. Spherical balls for use with electromagnet come in six sizes from 1275 to 6350 lb. Special size Ni-Hard balls can be made to order.

Circle No. 53

• Factory-Packed Idlers

Dual flexible contact seals highlight the latest *Jeffrey* MD and HD series of belt idlers. Factory packing and sealing creates a permanently lubricated idler, with the new Duoflex seal to keep dirt out and grease

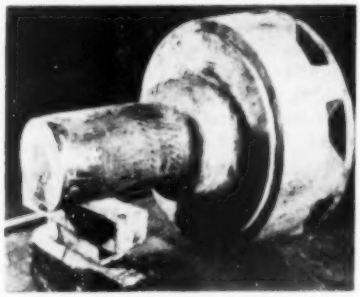


in. When and if regreasing is desirable, it can be done from either end through the shaft, the grease reservoir and the Neoprene connectors. Rolls are removed without loosening or removing the stands.

Circle No. 54

• Welds Mn Bronze

Bronze-Arc Mn, a new patented electrode for welding manganese

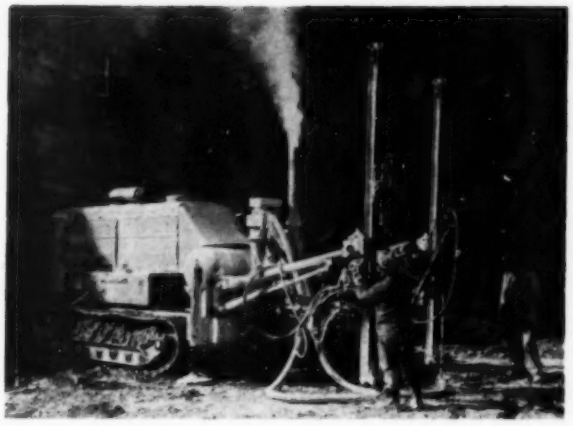


bronze, has been added by *Alloy Rods Co.* to eliminate the need for high preheating and interpass temperatures. This is said to do away with a major cause of distortion and warpage. Welds have an excellent combination of high strength, ductility and soundness.

Circle No. 55

• Fully portable, this sand washing and screening plant has been designed by Pioneer Engineering for production from sand bars or gravel pits and for washing and separating pre-crushed aggregate. It features a large vibrating screen for accurate separation, and a long twin-screw dehydrator to wash the material and squeeze out dirt and impurities. Total capacity is 100-150 tph.

Circle No. 56

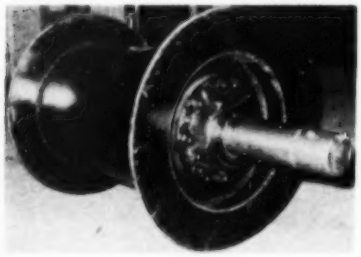


● Completely self-contained and self-propelled, this heavy-duty Drillmaster twin-drill rig has been introduced by Ingersoll-Rand. It needs only a two-man crew, has tractor-type steering, reversible air motors, and will go up a 30 percent grade. The high speed drills have hydraulic controls; use a 600 cfm compressor.
Circle No. 57

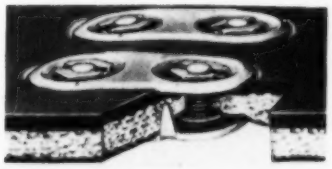
● World-wide tests covering several years have resulted in this new Demag-Universal excavator B-408, now being built in Germany. Air controls (two levers and two pedals) and other innovations give maximum operating ease. A 6-cylinder diesel engine provides power. All standard attachments are available.
Circle No. 58

● Cable Drums

Built to hold 6,000 feet of ¾-in. cable at 20,000 lb. tension, these



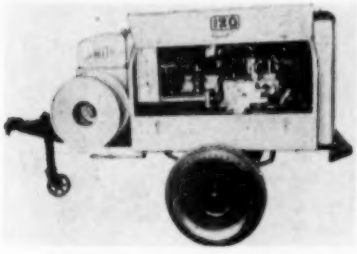
42-in. face *Wood Dale* cable drums are 36-in. in diameter and have a 5-5/16-in. shaft mounted on friction drive hubs. Total weight is 3,000 lb.
Circle No. 59



● Designed for conveyor belts where scrapers or plows are used, these new Flexco belt fasteners have the top plates bevelled at both ends so that the scraper will ride easily over them, for easier belt cleaning and less wear on the scraper.
Circle No. 60

● 120-cfm Compressor

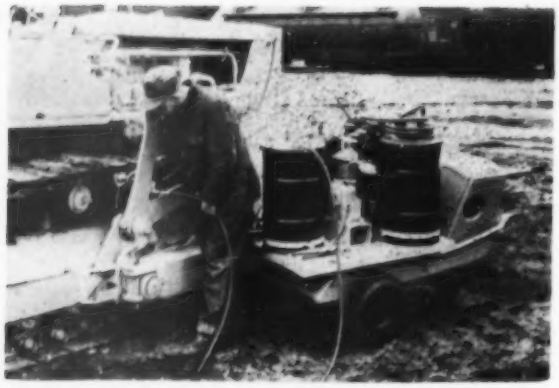
Combining heavy duty with light weight, this *Gordon Smith* air compressor delivers 120 cfm. It has large-area low-lift compressor valves for high efficiency, made of manganese bronze with stainless steel discs and springs. A finned aftercooler reduces air temperature approximately



200 degrees. A Chrysler model 22 industrial engine is used. There is no coupling or clutch.
Circle No. 61

● No wheel traction is needed to get excavating power with this new Dempster-Diggster combination excavator shovel and front end loader. Truck-speed mobility is combined with power shovel-type variable crowding action, hydraulically controlled. Tricycle steering gives a minimum turning radius. It has a torque converter.
Circle No. 62

● This bottom dumping "clamshell shovel" is one of the "Four-in-One" operations possible with a new Drott attachment for International TD-6 tractors. Moving a selector lever permits the operator to convert it into a bulldozer, a bullclam shovel, a front-end loader or a clamshell. Shovel capacity is ⅞-yd.; lifting capacity 3,000 lb.
Circle No. 63



● This handy self-powered service station by Prime-Mover Company has a compressor, air tank, space for three 100-lb. drums, tool trays, hoses, lubricant pumps, Alemite equipment and is powered by a 6-hp Wisconsin engine. It travels over rough ground, up steep slopes, etc. **Circle No. 64**

● High-speed loading is done at a rate of 4 cu. yd. a minute by this new heavy-duty H. P. Nelson bucket loader, tire or crawler mounted. The hydraulic swivel discharge conveyor turns 180 deg., reaches 11 ft., is over 14 ft. high and is independent of the bucket boom. **Circle No. 65**

● Dust Collector

A new self-cleaning cloth screen dust collector, type CH-3, has been announced by *Pangborn Corp.* It uses the reverse air flow principle

for the continuous cleaning of its filter cloth. This cuts operating and maintenance costs by permitting continuous automatic collection with constant peak air volume and suction, Pangborn says. A travelling manifold uses outside air for the reverse blowing action.

The manifold has a blocking diaphragm to cut off normal air flow through the vertical rows of screen frames on either side of the central row getting the reverse air blast. Dust blown free of the screen cloth drops into the hopper. The manifold then travels to the next section. This eliminates shutdowns for cleaning. Standard CH-3 sizes have 6-screen-high construction, but four and five-high units are available for small volume use. Existing Pangborn CH installations can be converted.
Circle No. 66

● Wheel Tractor

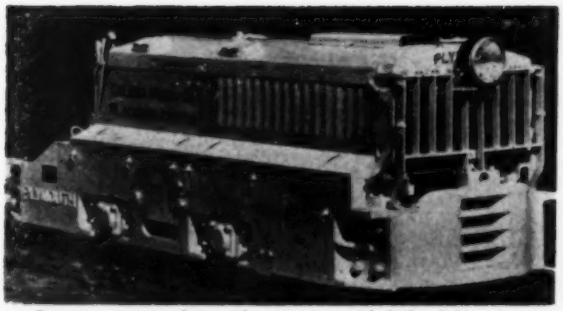
Designed particularly for use with scrapers No. 10 and 15 and W10 wagons, a new wheel tractor introduced by *Caterpillar* has a 6-cylinder Cat engine that develops 150-hp. at 1,800 r.p.m. Ten forward speeds give up to 24 m.p.h., and optional drive gears will give 31.3 m.p.h.

The DW15 uses a braking system with built-in jack-knife protection, actuating the brakes on the hauled

unit before braking the tractor. An improved hitch construction makes hitching and unhitching easier. The tractor has a 75-gal. fuel tank, sufficient for a day's work. Front bumper, pull hooks, front and rear headlights and a comfortable foam rubber seat are other conveniences.
Circle No. 67

● This 12-yd. Autocar end dump, powered by a 165-hp Cummins diesel, is a recent addition to the fleet of some 30 diesels operated in the ready-mix and quarry activities of Miron & Frere Ltd. of Montreal. **Circle No. 68**

● Cummins diesels serve in the big 4500 Manitowoc 5½-yd. shovel at work here, and the 22-ton Euclid rear dump trucks it feeds. The shovel has a 550-hp model NVHS-1200 Cummins; the trucks, 300-hp NHRBS-600 engines. **Circle No. 69**



● Operator ease and smooth operation with little shifting is provided in Plymouth Locomotives through the use of Fuller converter and corresponding automatic torque multiplication. Fate-Root-Heath uses Fuller converters in its 3 to 10-ton diesel or gasoline locomotives. **Circle No. 70**

● No tractor is used in this experimental 4-wheel drive Euclid Twin-Power 18-yd. scraper, which field tests indicate will be able to self-load in many materials. A single 300-hp diesel behind the bowl drives all wheels. The dozer blade is removed for high-speed haulage. **Circle No. 71**

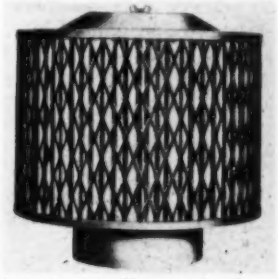
● Two-inch Pump

Rated at 10,000 gph, a new Sure Prime pump will actually handle all the water than can be pulled through a two-inch suction line under average

conditions, *Jaeger* says. A 28-in. vacuum at the intake is not unusual, and the Sure Prime delivers its rated capacity at low speeds, 2,400 to 2,550 rpm. A Wisconsin AKN engine delivers 5.2 hp. at 2,500 rpm. The pump weighs only 190 lb. when mounted on 13-in. dia. pneumatic tires; 160 lb. without tires. The liner plate reverses, the impeller adjusts.
Circle No. 72

● Engine Air Filter

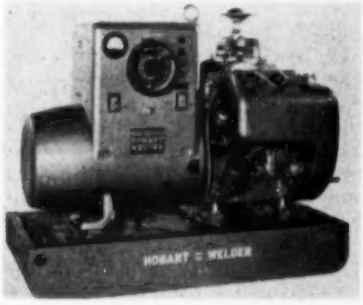
Designed for portable or stationary engines and compressors, an intake air filter that uses rayon flocked screen wire as its filtering medium has been introduced by *American Air Filter*. This material was developed for combat plane carburetor intake filters during World War II. Im-



pervious to gasoline and other solvents, the FS filter can be cleaned by many methods. It may be used dry or oil-coated with little variation in efficiency. The dust-holding capacity when oiled compares to that of a viscous type filter. An inner baffle equalizes air flow and protects against backfires.
Circle No. 73

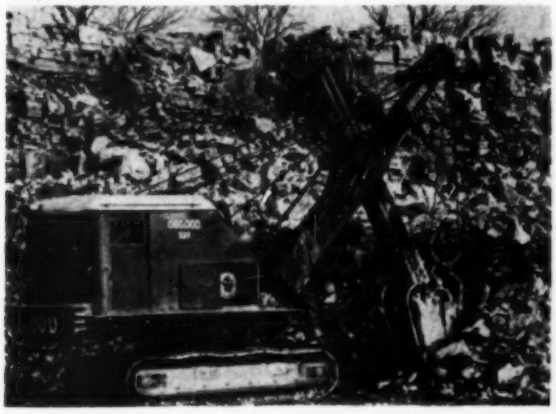
● Power Plant & Welder

An ingenious combination power plant and electric welder has been designed by *Hobart Bros.* A simple changeover enables the plant to be

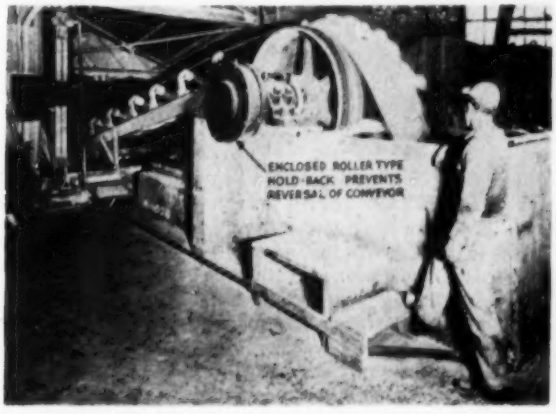


used as a 60-80 volt a-c welder or a 110 or 220 volt electric generator. It will produce single phase 110 volt 2-wire 60-cycle or 220/110 3-wire a-c, with an 80 percent power factor. It can be had with 50-cycle output also. A 4-cylinder Wisconsin air-cooled engine powers the generator. The dual purpose machine will operate a 200-amp. welder also.
Circle No. 74

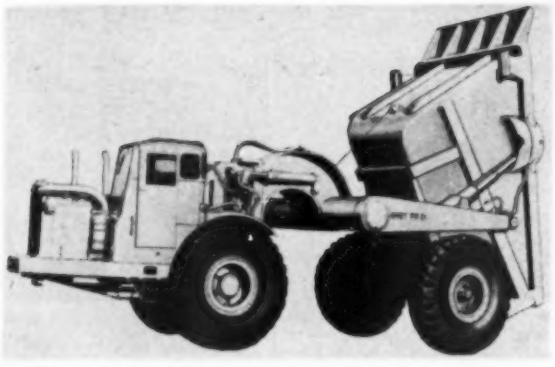
● Osgood-General's new 2-yd. shovel, the "920", has been added to meet the need for a fast, powerful, rugged materials handler in this size that will provide high production with a minimum of downtime. Fully convertible, it has air control, air-tube clutch and torque converter. **Circle No. 75**



● Reversal of bucket elevators or inclined conveyors due to power failure under load is prevented by an enclosed roller-type hold-back developed by Stephens-Adamson. It mounts directly on the drive shaft, will engage instantly, and releases as soon as forward motion resumes. **Circle No. 76**



● Torque converter and clutch-type reversing transmission make for quick loading of trucks or bins with this Le Roi Transo TLF-150. Although there's plenty of room between truck and loader, the 1½-yd. bucket centers over the truck at a 10-ft. dumping height.
Circle No. 77



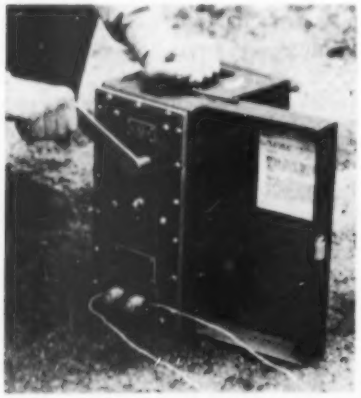
● This is the Caterpillar-Athey Products rear-dumping tractor-trailer team that has invaded the off-the-road rear dump field. It hauls 33 cu. yd. of rock at speeds up to 20 mph, makes non-stop turns within a 35-ft space, and uses domestic burner oil for fuel.
Circle No. 78

● Bigger Payloads

Bigger payloads—by as much as five to seven tons per truck—are forecast by *Chain Belt Company*, with its announcement of an extra front axle that can be added in any standard truck. The Rex Spangler dual-steering tandem front axle is coupled to the truck's axle by a walking beam. This results in a tandem bogie with "center-poise" steering and equal load distribution on all four front wheels under all driving conditions, Chain-Belt says. The truck's turning radius remains the same. Greater operating economy, more safety and better use of the highways result, the company says.
Circle No. 79

● Blasting Machine

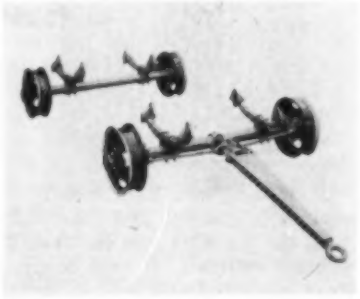
Maximum safety and reliability are built into a new portable blasting machine developed for *Atlas Powder Co.* A condenser discharge



type, generator operated, it is believed to be the first to use a high voltage d-c generator directly connected to charge the condensers. Self-contained, always ready for use, it is weather proofed, weighs 30 lb., and will not fire until the condensers are fully charged (450 volts). There is no danger of residual charge to cause accidental detonation.
Circle No. 80

● Extra Heavy Axles

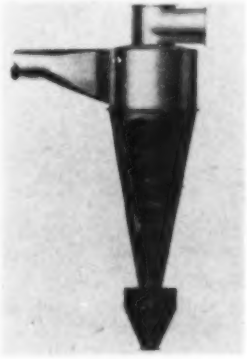
Designed for compressors, crushers and other heavy portable equipment, an extra-heavy axle assembly has been announced by *United Mfg. Co.* The new Caravan axle carries 7700



lb. per axle, has extra-sturdy steel construction, and automotive steering and controlled camber, tow-in and caster for positive trail at high speeds regardless of terrain conditions. Electric or mechanical brakes can be installed.
Circle No. 81

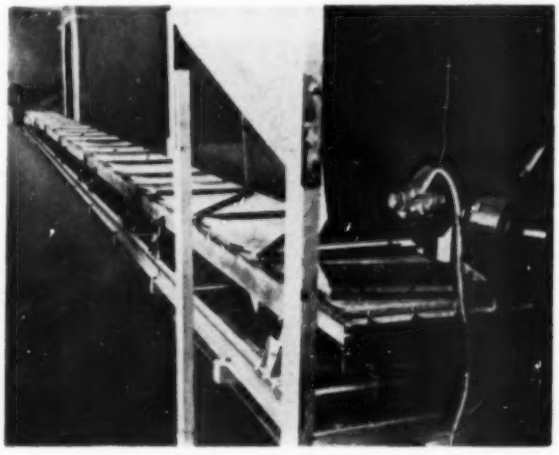
● Dust Collector

A new mechanical dust collector of the cyclone variety has been announced by *Banister Co.* This Dustmaster serves as a collector or as a



pre-cleaner for filters or electric precipitators separating dust from air by means of centrifugal force. It is built in standard sizes from 18 to 48-in. body diameters, and furnished in single, duplex, quad and two-stage arrangements, to be operated either under suction or pressure.
Circle No. 82

● This special vibrating conveyor, the Oscilveyor, has been designed by Gifford-Wood to transport in a closed housing materials which are not readily handled by other types of conveyors. The unit oscillates in a series of continuous forward-and-up, downward-and back movements, throwing the material forward a short distance each cycle. The pan of the 64-ft. unit shown is mounted on springs and vibrated by an electric motor thru special linkages.
CIRCLE NO. 83



Legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Recently the higher courts in various localities rendered unusually important decisions, knowledge of which will assist our readers to avoid similar legal controversies. Quite obviously, since the following citations are new, readers and their lawyers may use these citations advantageously to win unavoidable and unexpected law suits.

Widow Is Partner

Modern higher courts consistently hold that all members of a partnership are lawful agents automatically authorized to make a valid and binding contract for the partnership. Moreover, no partner can recover more than proportional profits earned by the partnership unless a special contract so specifies.

A few days ago a higher court held that the widow of a deceased partner is entitled to a full share of profits derived from the operation of the partnership business.

For illustration, in *Lissman v. McDonald*, 258 Pac. (2d) 1057, it was shown that a member of a partnership died. Previously the partnership was engaged in mining, processing, and marketing sand, gravel, and similar products under the name of the Monterey Sand Company. The net profits for last year were $90,493.67. Of this amount the court awarded the widow the sum of $12,491.33, representing her percentage as a partner of the profits for that year.

It is important to know that this court refused to allow the living partners any additional compensation for their personal services, time, and effort in operation of the partnership business. This court explained that if living partners expect compensation for their services in conducting a partnership business on the death of a partner, the partnership contract must contain a clause to this effect.

Circumstantial Evidence

The higher courts in all localities readily agree that circumstantial evidence is applicable to prove injuries to employees.

For illustration, in *Butler v. Fidelity & Casualty Company*, 76 S. E. (2d) 813, it was shown that one Butler was employed by the Whitley Construction Company as a driver of a ready-mixed concrete truck. One day Butler drove a truck loaded with mixed concrete to a lot where the concrete was to be used in paving a driveway. Butler backed the truck up the driveway and struck a retaining wall at one side, damaging the chute down which the concrete mix was to be poured. Butler got out of the truck at about the same time that the man holding the chute let go of it, and Butler was struck across the head and face by the chute. He was stunned by the blow and was in pain for the next few days, but he worked for a few days after the accident. Finally he

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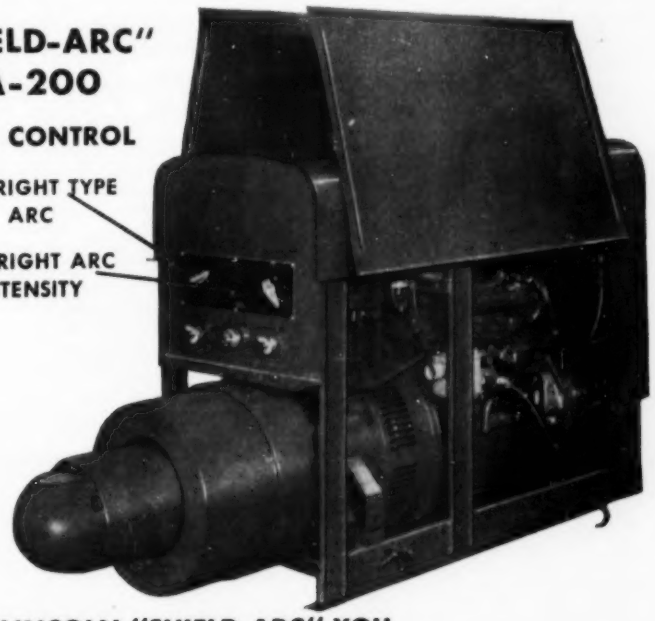

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became deaf in his right ear and weak in his right arm and leg, and is unable to speak. He had previously been in good health.

Although the Industrial Board awarded compensation to Butler for his injuries, the lower court reversed the verdict. However, the higher court reinstated the Board's verdict and allowed Butler adequate compensation, as based on circumstantial evidence and testimony.

Also, last month a higher court held that circumstantial evidence may be used to prove that an employer discriminated against an employee, and violated labor laws.

For example, in *National Labor Relations Board v. Cold Spring Granite Company,* 208 Fed. (2d) 166, the testimony showed facts, as follows: The Cold Spring Granite Company discharged an employee. The testimony proved that this employee was the chief proponent of unionizing his fellow employees. This was known to the employer, and the employee was threatened with discharge because of his activities in promoting the union. The employee had been with the employer for over six years, was a skilled workman, and had had more experience than the employee hired to replace him.

In view of this testimony the higher court held that the Cold Spring Granite Company must reinstate the employee, and said: "The inferences to be drawn from the evidence and all the surrounding circumstances were for the Board; and the question on review is not whether the evidence might support other conclusions than those arrived at by the Board but rather whether the evidence viewed in a light most favorable to the prevailing party is substantial. The Board is the sole judge of the facts, the credibility of witnesses, and the inferences to be drawn from circumstantial evidence."

Ordinance Is Violated

In certain areas any new industrial additions or uses of premises are prohibited under a new zoning ordinance.

For example, in *Markey v. Danville,* 259 Pac. (2d) 19, the testimony showed facts, as follows: On February 17, 1947, the Board of the County adopted a zoning ordinance, under which "industrial" operations were forbidden.

Further testimony showed that for many years a company had conducted on the premises a wholesale business in building materials. Sand, gravel, and cement were kept and stored at ground level in small quantities. No mixing of concrete for delivery took place on the premises. In September, 1948, 18 months after the ordinance was passed, the company began constructing on the same premises a plant for processing cement. The operation of the plant involved bunkers, hoppers, chutes, elevator or conveyor systems with electric motors, a fleet of transit-mix trucks and semi-tractor trucks, and a truck repair shop. Large quantities of sand, aggregates, and cement are brought to the plant by truck or railway car and dumped in an underground hopper from which they are transported to elevated bunkers—the sand and gravel by a conveyor system of endless belts, the cement by an enclosed bucket operation. By means of weighing hoppers the materials are weighed and dropped into mixing trucks.

In subsequent litigation the higher court granted an injunction against operation of the new plant, and said: "The cement mixing operations complained of were completely different from the small-scale storage of materials carried on when the zoning ordinance went into effect. It does not permit industrial use in a general commercial district."

For comparison see *Wealth v. McCrady-Rodgers Company,* 316 Pa. 155. This court held that the making of ready-mixed or transit-mixed concrete in its plastic state is manufacture, and involves industrial commerce.

Surety Contract Must Be In Writing

A few weeks ago a higher court held that a verbal or oral guarantee that a person will pay another person's debt is void.

For example, in *Artic v. Schmall,* 57 N. W. (2d) 287, these facts were disclosed: A woman named Schmall made a written contract with a general contractor for the construction of four duplexes on her premises. The contractor put up a bond guaranteeing the performance of his contract in accordance with the drawings and specifications. The contractor sub-contracted a portion of the work to a sub-contractor. The latter started the work, but he had some trouble getting money from the general contractor, and refused to complete the job. Schmall, the property owner, told the subcontractor that she wanted to get the work done, as it was getting cold, and she wanted to get the apartments finished and rented as soon as possible. He advised her that he would not do anything further until he received some money. Then Schmall said: "You don't have to worry. I'll see you get your money." In other words, Schmall verbally guaranteed that the subcontractor

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would be paid his full contract price. The subcontractor started work two days later and finished his contract.

Later, the subcontractor sued Schmall for the money due for installation and materials after the general contractor refused payment. In holding Schmall not liable, the higher court said:

"Any other promise by a third person (Schmall) to pay the debt must be in writing; otherwise it is void by operation of the provisions of the statute of frauds."

This court explained that under no circumstances is any person liable for another's debt on oral promise.

The subcontractor argued that even if Schmall's verbal promise is void to pay the balance due on his contract, yet Schmall should be held liable for payment because she is now benefitting. In this respect, the higher court said:

"Although the promise is void, can defendant (Schmall) be held liable solely because she is the owner of the premises and, because thereof, received the benefits of their installation? We think not."

Law of Contracts

Recently a reader asked this question: "If a printed contract contains "interlined" pen-written clauses which conflict with the printed clauses but favor a purchaser, can the seller hold the purchaser to the obligations in the printed contract?" According to a late higher court decision, the answer is no.

Many sale contracts have been before the courts which comprise printed conditions with either typewritten or pen-written interlined provisions or clauses. In other instances, sales contracts may consist of typewritten parts with standard printed restrictions. And in other instances either or both of the typewritten and printed portions may be modified or contradicted by insertions of pen-written clauses. Here is the law: Where a contract is printed, typewritten, and pen-written, the pen-written clauses always prevail over the printed and typewritten portions, and the typewritten parts prevail over the printed portions.

For illustration, in the leading case of *Willis v. Voth*, 86 S. E. 671, the higher court said:

"There is a well established rule that where, as in the use of printed forms, a contract is partly printed and partly written, the writing will prevail if there is conflict between the printing and the writing. And the same is true where the contract is partly printed and partly typewritten. The written or typewritten part always will prevail. . . ."

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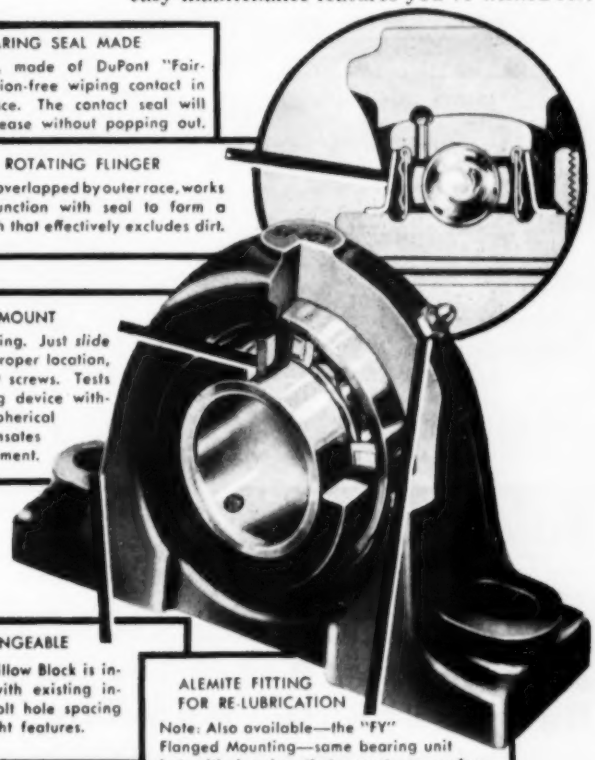

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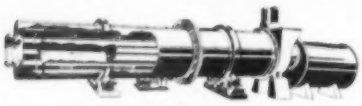

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Contract Is Void

Recently a higher court laid down this important law: If a state law prescribes that the authority of a public officer is limited, a contract is void and unenforceable which disregards this law.

For example, in *Bear River Sand & Gravel Corporation v. Placer County*, 258 Pac. (2d) 543, the testimony showed facts as follows: A state law provides that county highway commissioners can make valid contracts for hiring employees or purchase, lease, or hire road equipment and materials only if such contracts are approved by the county board of supervisors.

The Bear River Sand & Gravel Company sued a county for several thousand dollars claiming that the latter had breached a contract which its highway commissioner had made for the purchase of crushed rock for use on county roads. The testimony showed that the county board had not countersigned or approved the contract. Therefore, the higher court held the county not liable and said: "If Barieau (commissioner) ordered the crushed rock for the county, he had no authority in the law to do so and his act was void. The void acts of a public officer cannot be ratified. The road commissioner was without power to negotiate such a sale."

For comparison, see *Reams v. Cooley*, 152 P. 293. In this case the testimony showed that a county's officer in good faith purchased a large quantity of materials, which the county used on its roads. However, the officer exceeded his authority, given by state laws, when he made the purchase contract. Hence, the higher court refused to hold that the county must pay any money to the seller of the materials. This court said: "No government, whether state or local, is bound to any extent by an officer acting in excess of his authority even though it has received substantial benefits deriving from the act."

Employee Is Lawfully Discharged

Recently a higher court held that an employer always may lawfully discharge an employee who fails to report regularly for work, or who drinks excessively. This is so irrespective of provisions of the Taft-Hartley Act, 29 U.S.C.A. 158 (a) (1, 3, 5) to the contrary.

For instance, in *National Labor Relations Board v. Century Cement Manufacturing Company*, 208 Fed. (2d) 85, the testimony proved these facts: A corporation engaged in manufacturing natural cement at its plant was found by the National Labor Relations Board to have there violated the law by discharging an employee. The corporation appealed to the higher court and proved that the employee was absent from work very frequently and, also, that he was drinking excessively.

The higher court held that the corporation was lawfully entitled to discharge the employee and that it need not reinstate him. This court said:

"He was refused reinstatement, according to the respondent's (corporation's) evidence, because of his record of excessive drinking and absenteeism. That was good reason for refusing to reinstate him, his drinking and absenteeism was well established, and the inference that the refusal to reinstate was unlawfully discriminatory in the light of such evidence to the contrary was quite unjustified."

Eminent Domain

All higher courts hold that the law of eminent domain enables a public corporation, a state, a county, or a city to appropriate private property for public purposes. However, according to a late higher court decision this law is not applicable to private contractors who perform

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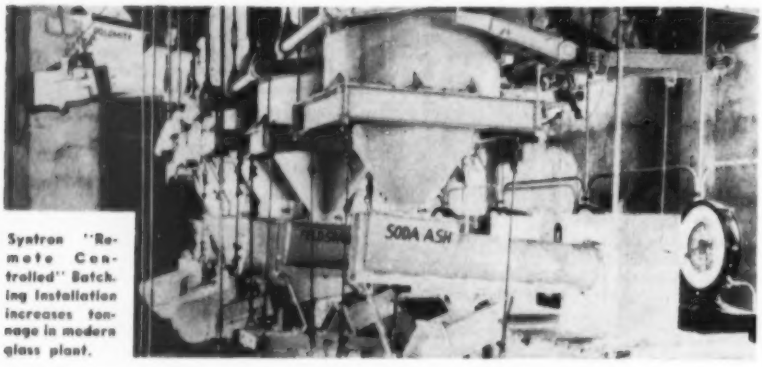

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For illustration, in *Ketchikan Spruce Mills v. Alaska Concrete Products Company*, 113 Fed. Supp. 701, it was shown that some of the gravel removed from a river bed had been supplied for projects under construction by private contractors for use of a municipal corporation.

In subsequent litigation the higher court held that the law of eminent domain was not applicable.

When Insurance Policy is Void

A reader asked this question: "When is an insurance policy uncollectible?"

A few weeks ago a higher court held that an insurance policy is automatically void and not collectible (1) if the insured obtained the policy through fraudulent or deceitful statements made in the original application; or, (2) if the loss resulted from gross negligence or willful acts of the insured; or, (3) if the testimony proves that in any way the insured violated the terms of the policy.

See *Niagara Fire Insurance Company v. Lowell Corporation*, 56 N. E. (2d) 28.

Of course, these rules of law are not applicable to insurance against injuries under the State Workmen's Compensation Act. Here the law of the state is the controlling factor. For illustration, the higher courts hold that an injured employee may recover damages from his employer only when the injury resulted from negligence of the employer. On the other hand, an employee can receive compensation under the State Workmen's Compensation Act whenever the injury was sustained while the employee was attending to his regular work, whether the injury resulted from negligence of the employer, or otherwise. This is so because state laws so provide. Also, the higher courts hold that an employee who is protected by the State Workmen's Compensation Act cannot sue his employer for damages.

For instance, in *Masich v. United*, 191 Pac. (2d) 612, it was shown that an employee is suffering an injury which he sustained, so he contended, because his employer failed to furnish him a safe place to work. The employee refused to accept the amount of compensation allowed by the State Workmen's Compensation Act, and sued his employer.

In subsequent litigation the higher court held that the employee must accept the amount of compensation specified by the state laws and that he could not sue his employer for damages.

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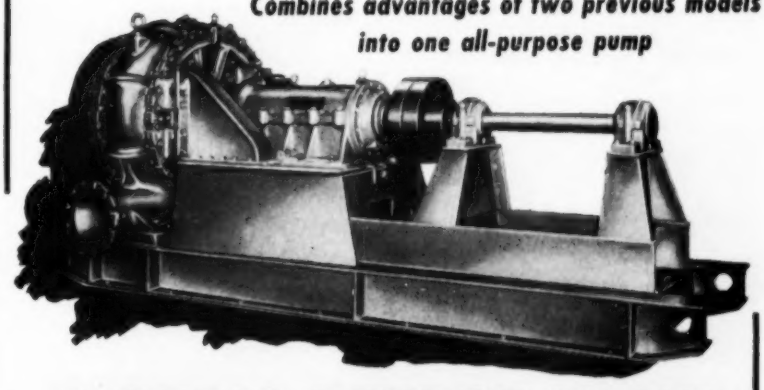

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traffic news

CENTRAL TERRITORY RAILROADS
Freight Traffic Committee

Docket 90472 (1)—It is proposed to establish a rate of 132 cents per gross ton on limestone, crude, fluxing, furnace, or foundry, when loaded in bulk, carloads, in open-top equipment. If cars are loaded to visible capacity, actual weight will apply from Conneaut, Ohio, to Erie, Pa.

Docket 90481 (2)—It is proposed to establish on waste stone, that is rip rap, spalls, chips, grout or breakwater, from Bedford-Bloomington, Ind., stone district to Ludington, Mich., in bulk, in open-top cars not protected by tarpaulin or other protective covering, 325 cents per net ton, minimum weight 90 percent of marked capacity of car.

Docket 90488 (2)—Proposed to establish on crushed stone, in open-top cars, bulk, minimum weight 90 per cent of marked capacity of car, except that when car is loaded to visible capacity, actual weight will apply from Osgood, Ind., 76 cents; from North Vernon, Ind., 98 cents, and from Georgia, Ind., 129 cents, to Lawrenceburg, Ind. This rate is proposed to meet motor truck competition; cents per net ton.

Docket 90499 (2)—It is proposed to establish a rate of 189 cents per net ton on limestone, agricultural, not ground or pulverized, unburned, in bulk, in open-top cars, carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Narlo and Maple Grove, Ohio, to Kendallville, Ind.

EASTERN RAILROADS
General Freight Traffic Committee

Bulletin N 1622-2—Proposed to establish rate of $3.88 per net ton from Woodbine, Md., to Niagara Falls, N. Y., and $3.65 per net ton from Woodbine, Md., to Graham, W. Va., on quartzite ganister rock, in open-top cars, bulk, carload, minimum weight 90 percent of marked capacity of car. These rates are subject to Ex Parte 175-B increase.

Bulletin N 1609-20—Proposed to establish rates on limestone, unburned, ground or pulverized, minimum weight 30 tons, from Engle, Martinsburg, Millsville, Charlestown, W. Va., Security, Md., Oranda, Stephens City, and Capon Road, Va., to Charlotte, N. C., as follows: in open-top cars not protected by a covering, $3.76 per net ton; in closed cars or open-top cars protected with covering, $4.26 per net ton. Rate subject to Ex Parte 175 increase.

Bulletin C 1610-50 (Shipper)—Proposed to establish rate on sand, (except molding; bonded, naturally or otherwise; and ground or pulverized) and gravel, in closed equipment or open-top cars, minimum 90 percent of marked capacity of car from Chardon, Ohio, to Janesville, Wis., $4 per net ton. This rate is subject to Ex Parte 175-B increase.

Bulletin C 1513-23—It is proposed to establish a rate of $1.31 per hundredweight on calcium silicate of lime, from Akron and Bar-

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berton, Ohio, to Bryan, Tex. Minimum weight of car, 20 tons. Rate is subject to Ex Parte 175-B increase.

Bulletin N 1513-24—It is proposed to establish rates on lime, common, hydrated, quick or slaked, from Chester Valley district, group 14, to Akron and Canton, Ohio, $6.84 per ton (minimum 15 tons) and $5.67 per ton (minimum 25 tons) from Lebanon Valley district, group 10, to Akron, Ohio, $6.55 per ton in 15-ton cars and $5.48 per ton in 25-ton cars. Subject to Ex Parte 175-B increase.

Bulletin C 1513-25—It is proposed to establish rate of 23 cents per 100 lb. (minimum 15 tons), and 19 cents (minimum 25 tons) on lime, common, hydrated, quick or slaked, carload, from Ludington, Mich., to Carrollville, Wis. Rates are subject to Ex Parte 175-B increase.

Bulletin C 1609-25—It is proposed to establish on stone, fluxing, furnace, or foundry, melting or refractory, unburned, in bulk, in box cars, etc., from Woodville, Ohio, to Montreal, Quebec, $5.60; to Hamilton, Ont., $3.80; to Wallaceburg, Ont., $3.15; and to Toronto, Ont., $4.00 per gross ton. Rates subject to Ex Parte 175-B increase.

Bulletin N 1611-M-11—It is proposed to issue rate of $1.50 per net ton to meet motor truck competition on stone, crushed, and screenings in bulk, in open-top cars or mixed carloads from Buffalo, N. Y., to Olean, N. Y. This rate is not subject to Ex Parte 175-B increase.

ILLINOIS FREIGHT ASSN.

Docket IRC 511-1359—It is proposed to establish rates on sand and gravel, in open-top cars not protected by a covering, minimum weight 90 percent of marked capacity of car, except that when loaded to full visible capacity, actual weight will apply, from South Beloit, Ill., to following Wisconsin points, per net ton: Clinton Junction and Evansville, 83 cents; Janesville and Milton Junction, 77 cents; Madison, 63 cents; Mt. Horeb, 116 cents; Dodgeville, Watertown, and Lake Mills, 99 cents; Jefferson, 78 cents; and Deerfield, 105 cents. Subject to X-175-B increase.

Docket IRC 511-1371—It is proposed to establish a rate of 120 cents per net ton, carloads, on agricultural limestone from McCook, Bellwood, and Harvey, Ill., to Brownwood, Delavan, and Minier, Ill. This is subject to X-175-B and is applicable on Illinois Intrastate traffic.

Docket IRC 511-1372—Proposed to establish rate of $1.23 per net ton on crushed stone and $1.13 per net

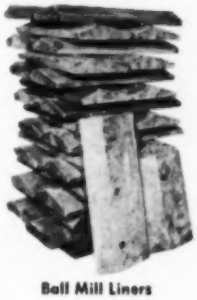
The Steel that Builds a "CALLOUS" to Resist Wear!

Outstanding for wear parts in crushers, pulverizers, mills, conveyors, shovels, etc.

TISCO®
MANGANESE STEEL
The HARDER it works ...the HARDER it gets

Dipper Teeth

Crusher Roll Shells



Ball Mill Liners

- **Cold work-hardens to needs of the job**
- **Outlasts other alloys 2 to 5 times under heavy impact and abrasion**

TISCO Manganese Steel actually grows stronger with increasing wear-resistance under the heavy pounding, shock and abrasion that destroy most other alloys. It has never been surpassed for wear-resistance in punishing service.

Specify TISCO for new equipment or replacement parts. Get full benefit of Taylor-Wharton's long experience producing and applying manganese steel, which assures the right analysis for the job—sound castings that are properly heat-treated and ground to accurate dimensions—careful inspection by the most modern techniques to provide flaw-free castings.

Rebuild and repair worn parts with TIMANG Weld Rod, Rounds, Squares, Flats, Plates, Repoint Bars, Grouser Bars, Tooth Repointers.

Write for descriptive bulletins.

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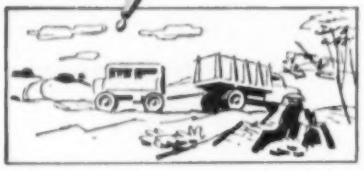
TAYLOR-WHARTON IRON AND STEEL CO.

HIGH BRIDGE 3, N. J.
Cincinnati, O. Birmingham, Ala. Easton, Pa.

CARAVAN AXLES

. . . engineered for greater field performance!



CARAVAN engineers consider the facts! No matter where your product is rolling . . . in open fields, on hazardous rain-soaked roads, through extreme cold . . . you are assured of dependable performance when it is mounted on CARAVAN Axles.

Designed and engineered for load stability, CARAVAN Axles provide a massive, heavy-duty steering arm . . . extra-heavy center arm stop blocks . . . heavy-duty steering knuckle . . . and precision ground spindles. These quality engineered assemblies guarantee positive trail at high speeds as well as stability for your equipment over the roughest terrain.

For engineered superiority specify . . . CARAVAN Axles.

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UNITED MFG. COMPANY

000 W. INTERSTATE ST. • BEDFORD, OHIO

ton on agricultural limestone, in open-top cars from Thornton, Ill., to St. Elmo, Ill. Rates subject to X-175-B increase.

WEEKLY DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION PROPOSALS

Docket A 18048—It is proposed to establish rate of 601 cents per net ton in open-top cars and 647 cents net ton in closed cars on limestone, ground or pulverized, carload, minimum weight 40 tons, from Cartersville, Ga., to Rockford, Ill.

Docket A 18163 (c)—Proposed to establish rate on stone, granite, limestone, or marble broken, crushed, ground or pulverized, value not exceeding $8 per net ton, carload 40 tons, to Jackson, Miss., from Pelham, 230 cents; Cobb City, Ala., 250 cents; Crab Orchard, Tenn., 280 cents; Cowan, Tenn., and Lithonia, Ga., 270 cents net ton.

TRUNK LINE TERRITORY RAILROADS

Freight Traffic Committee

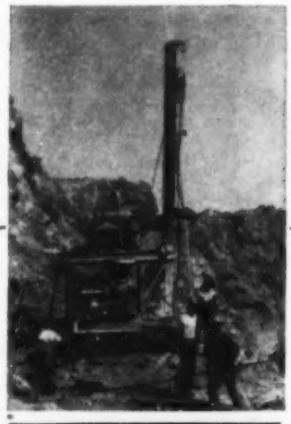
Bulletin N 4609-6—Proposed to establish a rate of $2.35 per gross ton on limestone, crude fluxing, foundry or furnace, when loaded in bulk, in open-top cars,, minimum weight 90 percent of marked capacity of car, from Myerstown, Annville, Palmyra, and Swatara, Pa., to Coxton, Pa. Rate subject to Ex Parte 175-B increase.

Bulletin N 4611 M—Proposed to issue rate of $2.19 per net ton from Glenn Moore, Pa., to Beaver Dam, Md., on stone, crushed, and screenings, in bulk, in open-top cars, straight or mixed carloads, carload minimum weight 90 percent of marked capacity of car. This rate is issued to meet motor truck competition and will not apply on agricultural limestone or ground limestone, unburned, fluxing stone or firestone; or stone coated with oil, tar, or other bituminous materials.

NORTH PACIFIC COAST FREIGHT BUREAU

Docket X Nc 3985—A request has been made to establish a rate of 3 cents per hundredweight on rock, crushed, carload, from Centralia, Wash., to South Bend and Raymond, Wash., area. This rate is not subject to X-175-B increase.

Docket NC-4032 (S)—Request is made for a rate of 25 cents (minimum 50 tons) on lime, common, from Helena, Mont., to Spokane, Wash.; also adjustment to Portland and Seattle.



Detachable, 4-inch, carbide Rok-Bit. Other Rok-Bits from 1¼" up—cross or chisel types.

Abrasive rhyolite no problem— with ROK-BITS

You're ready for anything when you put this blast hole drilling team to work—detachable, carbide Rok-Bits® and Brunner & Lay Drill Steel. Here exceptionally abrasive rhyolite is being drilled with 4-inch, 4-point Rok-Bits. Speeds up to 12.8 fph have been obtained. You, too, can cut your drilling costs, up your output, using Rok-Bits. Write for booklet—"Guide to Better Footage, Lower Drilling Costs."

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9300 King St., Franklin Park, Illinois, *Est. 1882*

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Brunner & Lay Rock Bit Corp., 2514 E Cumberland St., Philadelphia 25, Pa.
Brunner & Lay Rock Bit Corp., 350 Depot St., Asheville, N. C.
Brunner & Lay, Incorporated, 2425 East 37th St., Los Angeles 58, Calif.
Brunner & Lay, Inc., 150 Leslie St., Dallas, Texas

Docket Nc 4057—A rate of 18 cents per hundredweight is requested from Baring, Wash., to Portland, Oreg., on rock, crushed, closed cars, carload minimum weight, 30 tons.

PACIFIC SOUTHCOAST FREIGHT BUREAU

Docket 4713 (S)—A rate of 4¾ cents is requested on rock, crushed, sand, gravel, and other articles described in Item 250, Pacific Southcoast Freight Bureau tariff 166-G from Bailhache to Flosden and Vallejo, Calif. The minimum weight of a car is 50 tons.

Docket 4761—A rate of 7 cents per hundredweight is requested on lime rock, crushed, ground or powdered, carload, from Victorville, Calif., to Paramount, Calif. Not subject to X-175 increase. Minimum weight of a car is the marked capacity of car used.

Docket 4775—Request has been made for a rate of 15 cents on gypsum, crude, crushed, ground or powdered, carloads, Carp, Nev., to Los Angeles, Calif. Minimum weight of a car 40 tons.

SOUTHWESTERN FREIGHT BUREAU

Docket 68148 (S)—It is proposed to establish a rate of 48 cents per hundredweight (minimum 15 tons) and 40 cents per hundredweight (minimum 25 tons) on common lime, hydrated, quick or slaked. Rate not subject to X-162-6-8 increase. This rate applies from Kimballton, Va., to West Monroe, La.

Docket 68275 (S)—Proposed to establish a rate of 642 cents per net ton on stone, crushed, in bags, carloads, minimum weight 40 ton, closed cars, from Lithonia, Ga., to Western Trunk Line destinations including Kansas City, Mo. This rate is not subject to X-162-6-8 increases.

Docket 68360 (s)—Proposed to establish rates on dolomite, roasted, from Dolly Siding, Mo., to Chicago, Ill., of 413 cents, and to Kokomo, Ind., 500 cents per net ton. Rate not subject to X-162-6-8 increases. Minimum carload weight 90 percent of marked capacity of car.

TRANS-CONTINENTAL FREIGHT BUREAU

Docket C-195 Supplement 1—It is proposed to amend tariff 1 by publishing a rate of 874 cents per net ton on crushed silica rock from Dell Rapids, S. D., to Rock Island, Wash., minimum weight 50 tons. Not subject to X-1626-8 or 175 increases.

Supplement 2 to C-195 Reopened—To publish rate of 874 cents per net ton on crushed silica rock, carloads, minimum 50 tons, from Alexandria, S. D., to Rock Island, Wash. Rate not subject to X-162-6-8 increases.

WESTERN TRUNK LINE COMMITTEE

Docket X-E-41-1991 (S)—Proposed to establish a rate of $1.13 per net ton on agricultural limestone, carload, having value for soil treatment only, from Hannibal, Mo., to Lancaster, Mo. This applies on shipments in open-top cars and is subject to X-175-B increase.

Docket X-E-41 2000 (S)—Proposed to establish rate of 81 cents per net ton on sand and gravel (except asbestos sand and silica sand) from LaGrange, Mo., to Kirksville, Mo. This rate is subject to Ex Parte 175-B increase.

Docket X-E-41 2015 (C)—Proposed to establish on crushed stone in open-top cars protected by tarpaulin or other protective covering following representative points in Nebraska and South Dakota; from Spencer, Sioux Falls, and Dell Rapids, S. D., to representative following points: Verdell, Neb., 270; Anoka, Neb., 286; Fairfax, S. D., 297; Colome, S. D., 308; Mosher, S. D., 319. Rates are in cents per hundredweight. Subject to X-175-B increase.

THERE ARE MANY

Dump Bodies

Construction men, dump truck operators, and general builders are choosing Converto by an ever increasing margin. These are the men who have helped in the designing of the complete line of medium and heavy-duty hoists and bodies. They know that the rugged construction and versatile design of these units means longer, more trouble-free life. Converto hoists and bodies are flexible — easily adapted to perform special jobs.

All Converto Dump Bodies and Hoists carry many outstanding features as standard equipment, which are optional at extra cost on other makes of dumping units . . . proof that you can make every load a bigger payload with a Converto.

LOOK AT THE EXTRAS

- Full 60° dumping angle
- Full width cross members
- Completely welded throughout
- 8 gauge steel floor
- Extra-powerful hoists*

* All Converto hoists are tested to far exceed minimum lift requirements

...BUT ONLY ONE

CONVERTO MANUFACTURING CO.
CAMBRIDGE CITY, INDIANA

Converto

trade notes

Hi-Way Equipment Co., Houston, Tex., and Gopher Equipment Co., Minneapolis, Minn., have been appointed distributors by Gar Wood Industries, Inc., Wayne, Mich.

Henry H. Hunter, formerly assistant public relations director of Grant Advertising, Inc., has been appointed product publicity supervisor of Olin Industries, Inc., New York, N. Y.

This Company Uses

14 COTTRELL WHIRLCONES

to Save Fine Sand

PATENT APPLIED FOR

Until the Becker County Sand & Gravel Co. of Cheraw, N.C., installed fourteen 25-in. Cottrell WHIRLCONES in four of its sand-and-gravel plants, the retention of fines in the minus-50 plus-200 mesh range posed a disturbing problem.

Now, the WHIRLCONES are extracting a total of nearly 100 tons per hour of the desired clean, fine sands from the wash water and clay-like wastes overflowing the classifiers . . . and doing it at an operating and maintenance cost of only 6 cents per ton of recovered material!

Besides bringing sand up to specifications, WHIRLCONES quickly pay for themselves by increasing the salable tonnage going into the stock-piles, and by relieving settling ponds of an expensive, added burden. Skilled engineering design accounts for its miraculous efficiency; abrasion-resistant rubber linings assure long, troublefree service.

*WHIRLCONE is the registered trademark of the Cottrell Engineering Co.

You are paying the small price that a WHIRLCONE costs . . . whether you own one or not . . . in the loss of fines alone. All other benefits are yours as a bonus. Available in diameters from 6 to 50 in. to handle an input of 30 to 3200 g.p.m. Completely automatic from zero to full capacity.

Cottrell WHIRLCONES are lower in first cost than any other nationally-known wet-type cyclone. Cost less to buy, less to operate. It will pay you to get all the facts before you buy. WHIRLCONE performance is backed by the enviable reputation of Cottrell Engineering Co., for 32 years engaged exclusively in the design and fabrication of pit, quarry, and mining machinery.

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ENGINEERING CO.

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HAMMERMILLS • CONCENTRATORS • DUST COLLECTORS • DRIERS • ROTARY FURNACES CLASSIFIERS • SAND WASHERS • PORTABLE DRY WASHERS • GRIZZLIES • VIBRATING SCREENS • WHIRLCONE SEPARATORS

St. Regis Paper Co., New York, N. Y., announces that it has selected a 21 acre property in Franklin, Va., as the site of its new multiwall bag manufacturing plant. The new plant to be occupied by St. Regis under a long term lease, will replace the one presently leased from the Camp Manufacturing Co., Inc.

R. F. Allen, former president of Stansteel Corp., has been appointed assistant to the executive vice-president of H. K. Porter Co., Inc., Pittsburgh, Pa. He will assist in all phases of operation of the company and its various divisions.

Lewis K. Stamp, Alliance, Ohio, has been appointed representative for Ohio and Erie County, Pa., by the Newark Wire Cloth Co., Newark, N. J. He will represent the company in its three division: wire cloth, testing sieves, and the End-Shak sieve shaker.

Roger H. Bolin has been appointed manager of general advertising for Westinghouse Electric Corp., Pittsburgh, Pa., succeeding Harry J. Deines, who leaves the company to accept a position as vice-president of the J. Walter Thompson advertising agency in New York.

W. J. Ray, assistant sales manager of the Indianapolis Sales Division, Bemis Bro. Bag Co., St. Louis, Mo., has been transferred to the company's general offices in St. Louis. He will be assistant to S. M. Spencer, the supervisor of textile bag sales for the Bemis company.

The following additions to the board and officers of The Frank G. Hough Co., Libertyville, Ill., have been announced: Milton J. Weber, vice-president in charge of procurement, has been made a director; and Thomas F. Flood has been made vice-president in charge of manufacturing. Mr. Weber, the new board member, has been with the company since 1941 and has been a vice-president since 1952.

Thomas F. Flood

Milton J. Weber

J. E. Kennedy, president of Kennedy-Van Saun Manufacturing and Engineering Corp., New York, N. Y., was tendered a dinner by the division heads and executives of the company on the occasion of his 91st birthday. Fred Reedy, vice-president, is shown presenting Mr. Kennedy with a silver cigar box, gift of the executive personnel. The dinner was attended by over 300 members of the K.V.S. organization and invited guests from all parts of the United States and Canada.

Athey Products Corp., Chicago, Ill., has announced several new executive positions.

W. D. Lease, until recently manager of sales promotion, was elected vice-president, sales. He joined the company in 1946.

R. W. Kling, formerly chief engineer, was elected vice-president, engineering, and C. E. Matthews, manager of the service and parts department, was named vice-president, service and parts.

The Seattle district office of Bailey Meter Co., Cleveland, Ohio, manufacturers of industrial instruments and automatic control equipment, has moved to 200 Broadway, Seattle 22, Wash.

Marion Power Shovel Co. of Marion, Ohio, has announced the appointment of Cunningham-Ortmayer Co., Milwaukee, Wis., as a Marion distributor.

Neil McClarnan has been appointed sales supervisor of the Midwestern multiwall sales district with headquarters in Chicago, for St. Regis Paper Co., New York, N. Y. He has been associated with the multiwall bag industry for the past 21 years. Before joining St. Regis, Mr. McClarnan was general sales manager of the Jaite Multiwall Bag Division of National Container Corp.

To producers of sand and gravel, rare earths, and other mineral products

Combine digging and made-to-order processing plant aboard a YUBA dredge

This Yuba dredge (4000-ton displacement) digs 112 ft. below water with 18 cu. ft. buckets; has ample deck space for processing machinery.

Dredging costs under 5¢ per ton for gravel are not uncommon with large YUBA bucket ladder dredges. They also have dug cemented gravel, boulders, and into bedrock without costly drilling and blasting. They float in their own ponds, excavate without lowering surrounding water levels. Bucket sizes range from 2½ to 18 cu. ft. . . . digging depths from 10 ft. or less to 125 ft. below water.

Complete Plant Afloat

Your YUBA dredge can be built to screen out rocks; to break up and wash away surplus clay; to size through single or multiple screens; to remove mineral products by jigs, cones or magnetic separators. In short, you can completely process and grade your product as you dig, all aboard a YUBA dredge.

Choice of Handling Methods

Your dredge can be designed to stockpile ashore, load into trucks or shore conveyor; load into barges; or pump ashore through pipes.

Consult YUBA NOW. We can build you a new dredge . . . redesign, move and rebuild a used dredge . . . to fit your particular needs. Wire, write or call us — no obligation of course.

67

YUBA DREDGES — PROVED DEPENDABILITY

YUBA MANUFACTURING CO.

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AGENTS { SIME, DARBY & CO., LTD. • SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO • SHAWDARBCO, LONDON

Clarence S. Jarvis has been assigned to the Birmingham, Ala., district office of the Marion Power Shovel Co., Marion, Ohio, as a sales engineer. The district covers Louisiana, Florida, Alabama, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and a part of Arkansas.

Ralph J. Harkins has been appointed sales manager of Spray-O-Bond Co., Milwaukee, Wis. He was formerly with the Grayson Electric Co., as manager of its Milwaukee branch.

Union Bag and Paper Corp., New York, N. Y., announces two changes in the company's Multiwall Bag Sales Division:

Paul K. McKinney, multiwall sales representative, has been transferred from the company's Houston office to Kansas City, Mo. His new territory includes eastern Kansas, western Missouri, northwest Arkansas and Oklahoma.

D. Leon Williams, formerly of the company's New York office, will be the multiwall sales representative in Texas, with headquarters in the company's Houston office.

W. W. Frymoyer has been elected a vice-president of The Foxboro Co., Foxboro, Mass. Joining the firm in 1926, he served as director of research and in 1939 was appointed general superintendent. Since 1951 he has been factory manager and will continue in this capacity, supervising all instrument manufacturing activities of the company. He was formerly connected with the National Bureau of Standards, Washington, D. C.

W. W. Frymoyer

Edward R. Daley

Edward R. Daley has been appointed West Coast representative by Construction Machinery Co., Waterloo, Iowa. He will work with C.M.C. distributors in the seven western states, operating from his home in Burlingame, Calif.

Frank A. Phillips, director of sales, and A. W. Reidinger, sales manager, have been elected to the board of directors of Bay City Shovels, Inc., Bay City, Mich. Mr. Phillips joined Bay City in 1931 and Mr. Reidinger in 1938.

William H. McEnally has been appointed sales manager of the Standard Products Division of The Fairfield Engineering Co., Marion, Ohio. He became associated with Fairfield in 1950 as a sales representative in the Cleveland, Ohio area.

David Byrd, formerly assistant sales manager of the Wayne Division, has been appointed sales manager of the Richmond (Calif.) Division of Gar Wood Industries, Inc., Wayne, Mich. He started with the company in 1947 as a salesman in the Washington, D. C., branch.

Robert E. Sage has been made assistant to executive vice-president J. S. Roscoe, for The Lincoln Electric Company of Cleveland, Ohio. He will act as an administrative assistant for sales.

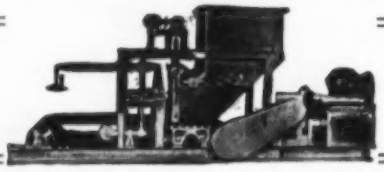
Before joining Lincoln, his sales experience included that of a manufacturer's agent and the operation of his own automobile agency.

1 Machine for every Scaling Need!

SCHAFFER POIDOMETER

WEIGHS • BLENDS • FEEDS • MIXES
RECORDS • PROPORTIONS

OVER 1300
now serving Industry



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VERSATILITY and DEPENDABILITY have established the SCHAFFER Poidometer as the top-flight weighing unit for handlers of raw and finished bulk materials.

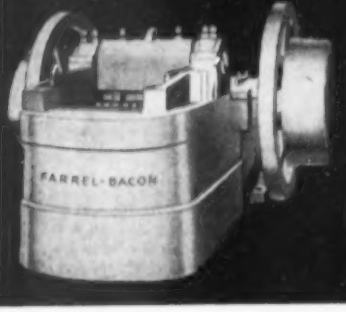
Automatically operated, Poidometers combine high speed and extreme precision in performing the various scaling functions.

These widely used machines are finely engineered and built for easy operation and sustained, economical service. They boost production records and improve product uniformity.

Available with total weight recorders, and remote controls for showing feed rate and changing feed rate.

SCHAFFER POIDOMETER CO.
2828 Smallman Ave. Pittsburgh 22, Pa.

COMPLETE CRUSHING PLANTS
designed and equipped by **FARREL-BACON**



Farrel-Bacon provides a complete engineering service, including design of plant and supplying all equipment from primary crusher to bin gate. Jaw-type crushers are available in sizes from 60" x 48" to 10" x 7" *Write for complete information.*

FARREL-BACON
ANSONIA, CONNECTICUT

BA-5

Allan K. Worrell, formerly a member of the organization and planning staff for Atlantic Refining Co., has joined the Industrial Relations Division of Atlas Powder Co., Wilmington, Del.

Power Transmission Equipment Co., Chicago, Ill., has been named exclusive Chicago area distributor in 21 Illinois counties and six Indiana counties in the Chicago and adjoining industrial areas, by the Morse Chain Co., Detroit, Mich.

Noman K. Anderson, former manager of the Industrial Division, has been named general sales manager of the Warner Electric Brake and Clutch Co., Beloit, Wis.

Worthington Corp., Harrison, N. J., has announced the appointment of three executives to new posts.

E. J. Tribble, former works manager at Harrison, N. J., has been named assistant vice-president in charge of manufacturing with headquarters at the Harrison Works; A. M. Tullo, former works manager of the Wellsville, N. Y., works, will now assume responsibilities as works manager of the Harrison works; and L. E. Hammer, former Wellsville assistant works manager, will take over Mr. Tullo's former post as Wellsville works manager.

Patrick J. Patton, Central district sales manager for Worthington, has been appointed East Central regional supervisor of the Positioning Equipment Division. He will be headquartered at Pittsburgh and will supervise positioner sales activities of Worthington distributors in the Buffalo, Cleveland, Detroit, Pittsburgh, and Cincinnati district office territories.

Parick J. Patton

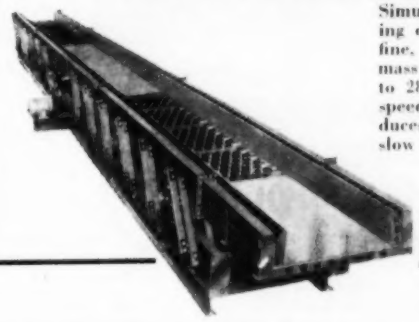
George V. Dutney

George V. Dutney, formerly associated with Johns-Manville Corp., in New York, has been appointed special assistant to the president, Nordberg Manufacturing Co., Milwaukee, Wis. He will make his headquarters in the company's New York office.

Controlled Feeding Is Answer To Better Cost Control... that's why SYNTRON VIBRATORY EQUIPMENT

Provides the most efficient, economical method for heavy tonnage handling of bulk materials. Positive control of feeding rates assures maximum production at less cost.

VIBRATORY Dual-Trough CONVEYORS



Simultaneous conveying and screening of most bulk materials—abrasive, fine, corrosive or lumpy. Swinging mass type conveyors that handle up to 280 tons per hour at controllable speeds. Energy balanced design reduces power consumption—eliminates slow downs.

Flat pan or tubular trough models—either base or suspension mounted.

GRIZZLY DISCHARGE FEEDERS

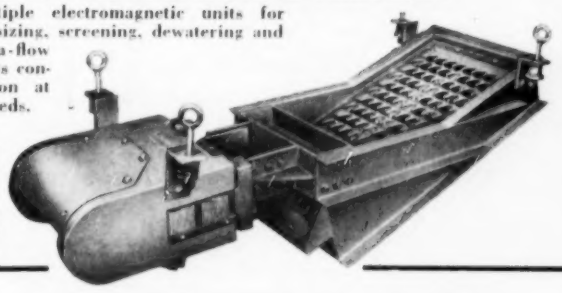
High speed, electromagnetic grizzly bar feeders that feed, scalp and coarse size in one operation. Finger-tip control permits positive adjustment of feeding rate to production requirements.

Models for small, medium or large tonnage requirements. No mechanical wearing parts such as gears, cams, belts, etc.

VIBRATING SCREENING FEEDERS

Single or multiple electromagnetic units for highly efficient sizing, screening, dewatering and feeding. Vibra-flow principle permits continuous operation at controllable speeds.

Available for overhead or below deck installation. All movement confined to leaf springs.



Write today for complete catalogue data—Free

SYNTRON COMPANY

385 Carson Avenue — Homer City, Penna.

A TOP-NOTCH EDITORIAL STAFF . . .

A staff of four full time editors and three contributing editors (four have engineering degrees) are at your service. No armchair editors, they travel thousands of miles every year getting first hand, the information you will want and need in your business.

And Pit and Quarry is geared for everyone in the industry. Clear, consise writing makes easy rapid reading, giving you, whether in top administration or lower production supervision, a clear picture of the operation involved. It will pay you to have a personal copy sent to your home.

USE THE ORDER FORM IN THIS ISSUE

The appointment of Garlinghouse Brothers, Los Angeles, Calif., as exclusive Southern California distributor of Kue-Ken crushers has been announced by Straub Manufacturing Co., Oakland, Calif.

Garlinghouse will distribute the entire Kue-Ken line, from single crushers to complete crushing plants.

Edgar F. Schaefer, 58, president of the Gardner-Denver Co., Quincy, Ill., and widely known as an industrial leader, died unexpectedly at his home in Quincy, Ill. Mr. Schaefer first joined the Gardner-Denver Co., manufacturers of air compressors, rock drills and air tools, in 1919, serving as cost clerk. Through rapid promotions, he became export manager and then assistant sales manager. In 1925 he was made vice-president in charge of sales and was named as a member of the Gardner-Denver board of directors. He was elected executive vice-president in 1942 and became president five years later.

Edgar F. Schaefer

Raymond H. Dobberfuhl, has been appointed manager of the R. & J. Dick Co., Inc., (Passaic, N. J.) office and warehouse for the Southern California area. The new service center at 5276 Atlantic Blvd., Maywood (Los Angeles), Calif., will maintain a complete inventory of power transmission and conveying equipment.

Herbert Boshea, former assistant supervisor of purchasing for the Home Laundry Division of General Electric Co., has been appointed purchasing agent for the Bridgeport Thermostat Division of Robertshaw-Fulton Controls Co.

Hudson Pulp and Paper Corp., New York, N. Y., has moved to new offices located at 477 Madison Avenue.

The Philadelphia district office of Bailey Meter Co., Cleveland, Ohio, has moved to larger quarters at 29 Bala Ave., Bala Cynwyd, Pa.

The Dorr Co., Stamford, Conn., announces the opening of a new office at 204½ Chestnut Ave., Virginia, Minn. This sales office will be staffed by Edward F. Porter and Leon D. Keller, two engineers of the Dorr Central Industrial Division.

New *simplicity and sustained efficiency in dust filtering and collection . . .*

Dualaire*

REVERSE-JET DUST COLLECTOR

Efficiencies up to 99.99%

Cloth filter systems of one design or another have long been used by industry for cleaning industrial gases and/or recovering dust or other suspensions. But three problems are common to such systems... (1) Extreme changes in pressure drop and filtering efficiency as dust cakes accumulate on the filter surface... (2) Wide pressure fluctuations and surges in the plant system as filter units become clogged or are cut out and rapped for cleaning... and (3) Rapid deterioration of the filter material by the vibration, shaking and rapping equipment used for cleaning.

But now the DUALAIRE Collector—as engineered by Western Precipitation, pioneers in the field of dust recovery—provides the answer to these and other problems common to conventional bag-house equipment.

The Dualaire Principle is Simple, Efficient. **Basically, each Dualaire filter unit consists of a cloth or felt tube, open at both the top and bottom. (A) Dust-laden gases enter at top of the tube and are filtered as they pass through the side walls of the tube to the exhaust system. (B) Dust particles collect on the inside of the tube and *before* the cake builds up sufficiently to affect filter operation, a tubular blow ring (C) automatically starts moving up and down the outside of the filter cylinder. A jet of air, concentrated by this blow ring, reverses the normal gas flow at the point contacted by the ring, thus jetting the dust layer off of the inner surface of the filter tube.**

This jetting action is further assisted by a flexing of the filter cylinder as the blow ring passes, thus cracking and loosening the dust layer from the inner surface, from where it drops to the recovery chamber below the bottom of the tube.

The entire operation is positive and simple. The blow ring starts its action *automatically* as soon as the dust layer causes a pre-determined pressure differential. And after the filter surface is cleaned, the blow ring *automatically* stops.

6 ADVANTAGES OF DUALAIRE DESIGN...

PRESSURE DROP remains uniformly low at all times because the dust is removed continuously in *small portions.*

FILTERING EFFICIENCY remains uniformly high at all times without the "choking" action characteristic of conventional bag-houses. Actual field tests show efficiencies as high as 99.99%!

DUST RECOVERY is in steady increments — not in sudden large "batches" as with conventional rapping systems. Thus the Dualaire eliminates surges and detrimental variations in the plant system.

FILTER ELEMENT has a much longer life because it is not subjected to the stresses of rapping or jarring while being cleaned. Dualaire reverse-jet cleaning action is gentle, yet far more effective.

GREAT SAVINGS are also made in space and the size of installation required. Because each Dualaire filter unit is cleaned more-or-less constantly without shut-down, there is no need for costly standby units — or the complicated switching equipment to cut standby equipment in and out.

BASIC UNITS are "sectionalized" and are available in 5 standard heights. Sections can be bolted together in any desired multiple, providing a capacity range to fit virtually any requirement. As needs increase, add more sections.

There are many other advantages built into the DUALAIRE. *For further details send for this descriptive 12 page booklet. Or contact your nearest Western Precipitation representative!*

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1015 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA

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PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

* ® "Dualaire" & "Multiclone" *Licensed by H. J. Hersey, Jr.*

QUESTION* **How much more material is there in a Three-Inch-Higher Windrow . . . 9% . . . 18% . . . 31% . . . ?**

Cross section of an average, 21-inch high windrow . . . the area (width x height ÷ 2) is 614 sq in.

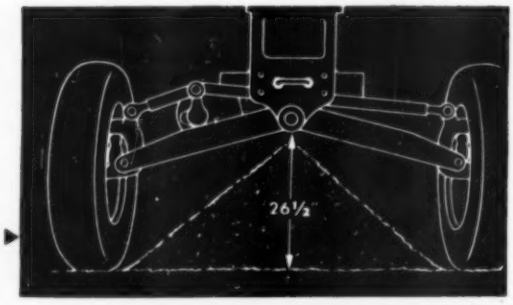
Now increase the height of the windrow by 3 in. The cross-section area now equals 804 sq in.

The difference: 190 sq in, over 30 percent more area, meaning over 30 percent more yardage.

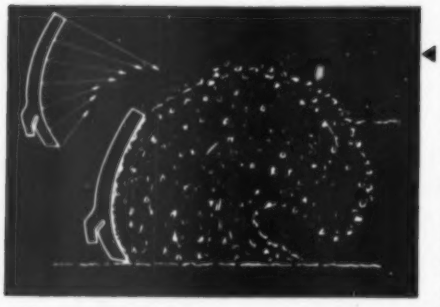
*Only a Combination of Advanced Design Features Lets a Motor Grader Handle Big Loads Fast

To take full advantage of even a *three-inch* difference in windrow height (as explained above) a heavy-duty motor grader needs new design and performance characteristics from front to rear and top to bottom.

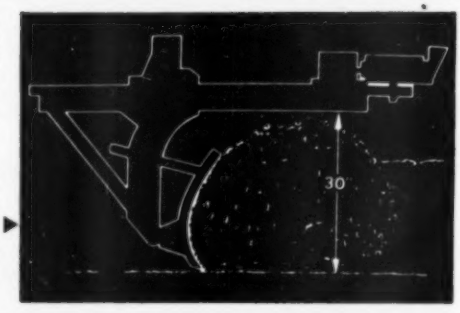
Let's analyze the Allis-Chalmers 104-brake-horsepower AD-40 to see how it measures up to these stiff requirements.



1 **A HIGH-ARCH FRONT AXLE** to straddle big windrows . . . take advantage of that three-inch difference and let big loads pass through to the blade.



2 **A ROLLING-ACTION MOLDBOARD** . . . to insure a "live" load that rolls freely off the blade . . . moves the load faster and takes full advantage of engine power.

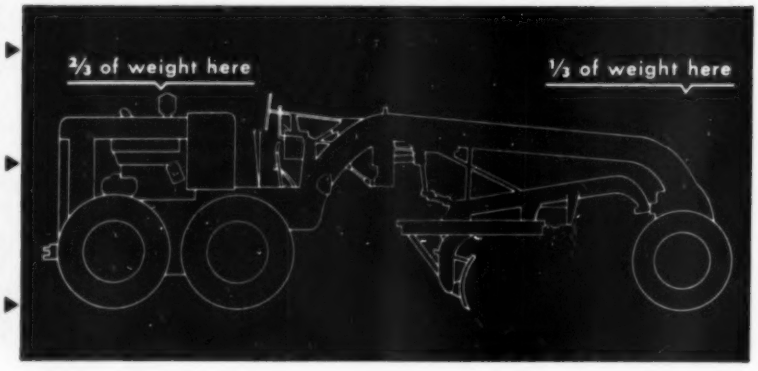


3 **AMPLE THROAT CLEARANCE** . . . to handle 30 percent bigger loads without disturbing free, rolling action . . . and without jamming dirt, oil-mix or any other material against the circle.

4 **FULL BLADE FREEDOM** . . . the exclusive tubular frame and a long tubular drawbar insure full blading effectiveness on the road, in the ditch or on the slope.

5 **BALANCED POWER, WEIGHT AND TRACTION** . . . a heavy-duty engine and *two-thirds* of the weight concentrated on tandem-drive rear wheels provide the best in traction, positive blade pressure and steer-ability.

6 **EASY CONTROL AND VISIBILITY** — A big platform with plenty of leg room, adjustable seat and steering wheel, power steering, assures working ease. Single member frame, low control board and tapered platform corners provide "pilot-house" visibility.



Your Allis-Chalmers dealer will be glad to show you how the AD-40 gives you the *differences* that mean more work done . . . by a demonstration under on-the-job conditions.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

The Only Rotary Blast Hole Drill Capable of Drilling 12¼-in. Holes

The Bucyrus-Erie 50-R

Now, you can take full advantage of the large hole drilling technique with a rotary drill too—the Bucyrus-Erie 50-R. Here's a machine, designed to drill 9⅞ to 12¼-in. holes, which has proved its ability to drill these large diameter holes in the shortest time possible.

For example, a 50-R, operating on 6¾ hour shifts in a large Indiana open pit coal mine, drilled 2,598 holes of 10⅝-in. diameter to an average depth of 42 ft. in six months. The average drilling rate was 125.1 feet per hour for a total of 844.4 feet per shift. Overburden consisted of medium hard sandstone with an overlay of hard shale.

Look Over These Important 50-R Features

1 Down pressure on the bit is hydraulically powered for maximum controlled penetration.

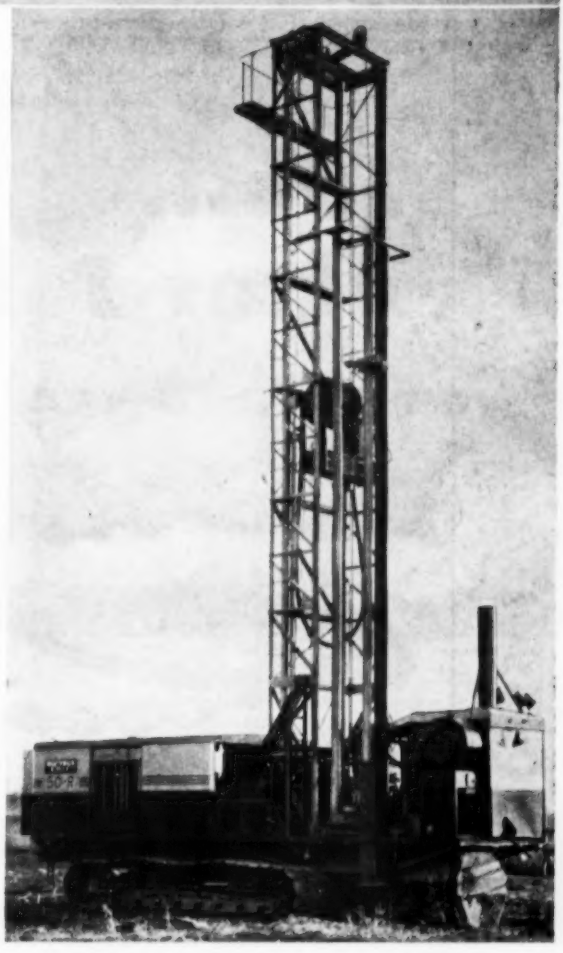
2 Ward Leonard electric control on rotation of drill pipe permits drilling at most efficient speed for a given formation.

3 Drills continuously for 32'-8" before an additional drill pipe section is added.

4 Drill pipe sections are added or removed in a few minutes with a remote-controlled, power-driven tool handling unit. No heavy manual labor is involved.

5 Cuttings are removed from the hole as drilling progresses by two 640-cfm air compressors. *Only the "fines"* are picked up and handled by the Roto-Clone precipitator. "Heavies" pile up adjacent to the drill hole for use as stemming material.

2854



There are many more reasons why the 50-R is the finest rotary blast hole drill ever built. Write for complete information today on how the 50-R can save you money in your mine or quarry.

BUCYRUS ERIE

South Milwaukee, Wisconsin

Dependable

Job... after Job

HENDRIX DRAGLINE BUCKETS

A TYPE AND SIZE FOR EVERY DIGGING PURPOSE

Hendrix Lightweight Dragline Buckets

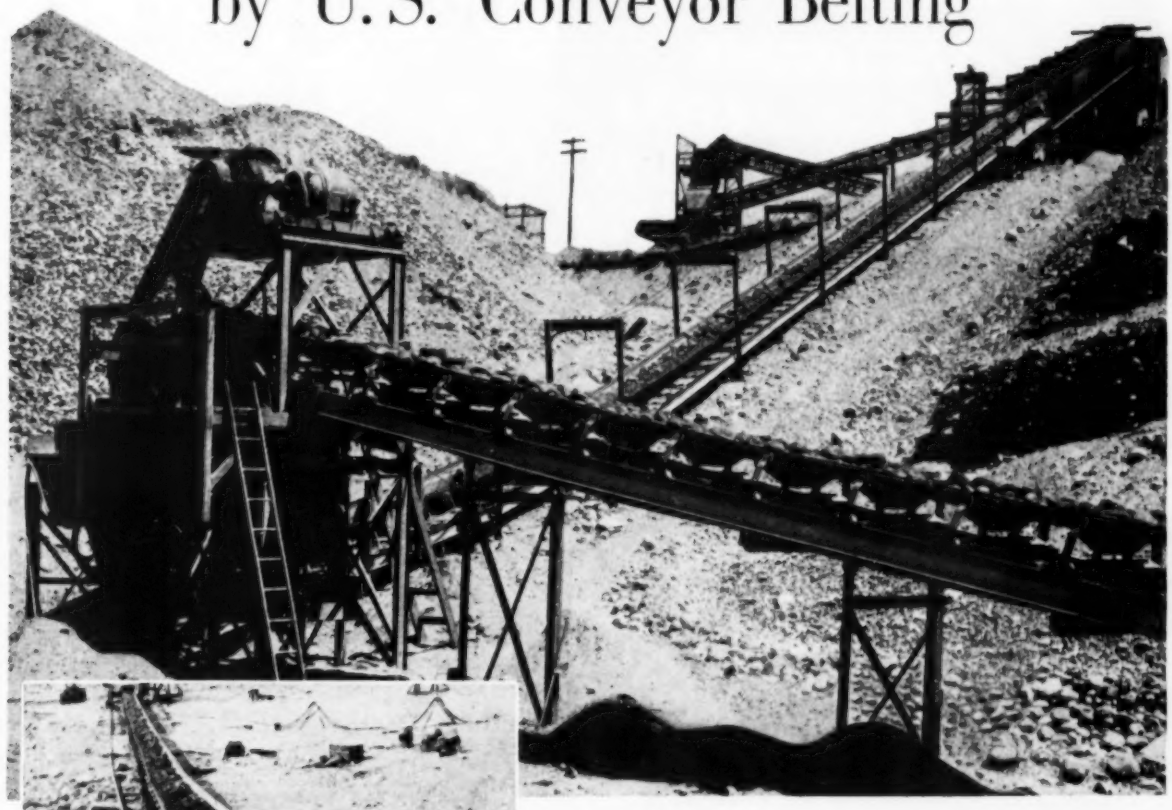
3/8 to 40 Cubic Yards

Hendrix Buckets available without perforations on special order.

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

The roughest haulage for the Chief Joseph Dam is handled by "U.S." Conveyor Belting



Note large and jagged aggregate on "U.S." Belt at Chief Joseph Dam. The belt starts the material from the pit to the rock plant. Upper photo shows another view.

"U.S." Research perfects it.
"U.S." Production builds it.
U.S. Industry depends on it.

The Chief Joseph Dam in the State of Washington will have the world's largest single unit powerhouse under one roof. In generating capacity, it ranks second only to Grand Coulee. Nearly 2 million cubic yards of concrete are going into the Dam's construction.

The raw aggregate ranges from fine sand to extraordinarily heavy boulders as large as 20" in diameter. The rock breaks clean, leaving sharp edges which are good for concrete interlock but very bad for ordinary conveyor belting. To handle this most critical portion of the haulage, United States Rubber Company conveyor belts were selected. Although now in their fourth construction season, the belts are still going strong, and have given *no difficulties or maintenance problems*. This is another example of U.S. Rubber's *Three-Way Engineering* in which "U.S." Belt engineers worked with the designers of the conveyor system and the engineers of the dam—to make sure of obtaining the *right* belt.

The latest pioneering development of "U.S." Belt engineers is the Nyton breaker strip. The nylon used in this breaker adds flexibility and greater resistance to impact.

For complete information, call any of our 26 District Sales Offices, each staffed with engineers, or write to address below.

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UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
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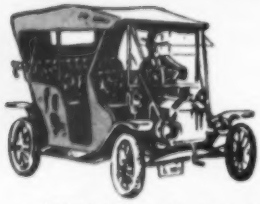
KUE-KEN CRUSHER

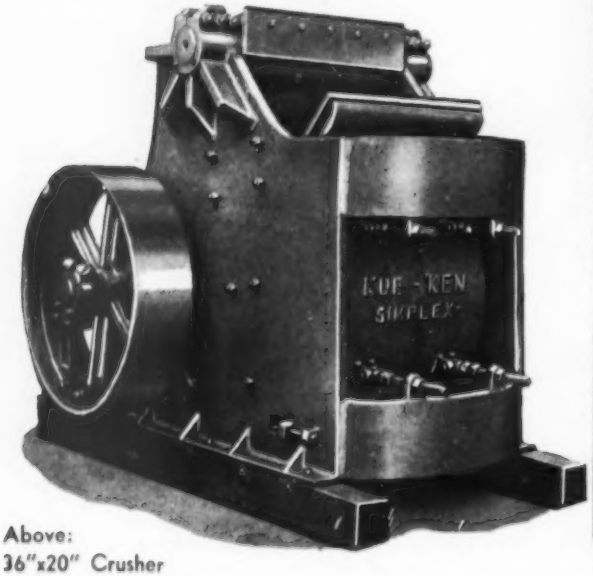
- ✓ LASTS LONGER
- ✓ OPERATES FASTER
- ✓ GREATER CAPACITY
- ✓ LESS MAINTENANCE

The only crusher whose moving parts run in a bath of clean cool oil!



You wouldn't drive a car that had to be oiled by a squirt can . . . then why settle for an outdated crusher that is lubricated in this manner or by similar inefficient methods? The price is worn out bearings, wasted horsepower, slow operating speeds and uneven crush.

Stop this waste . . . switch to a Kue-Ken crusher with the crankcase-type lubrication system.



Above:
36"x20" Crusher

Cutaway view showing Kue-Ken hinge pin (above) and "crankcase" (below).

Kue-Ken Crusher is completely sealed so dust cannot enter and oil cannot escape. A direct driven gear type oil pump draws oil from the "crankcase" and pumps it through a strainer and filter to all operating mechanism. An automatic pressure switch protects the crusher from oil failure. All toggles and seats are machined to micrometer tolerances which are maintained indefinitely because of the perfect lubrication system exclusive to Kue-Ken crushers. The hinge pin and overload safety device have separate sealed oil baths.

KUE-KEN CRUSHERS

"LOWEST COST-PER-TON CRUSHING"

Jaw Crushers Gyracone Crushers Overhead Eccentric Crushers Revolving Screens
Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

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Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor. 323 S. Matlack St., West Chester, Penn.

Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne, 8, England

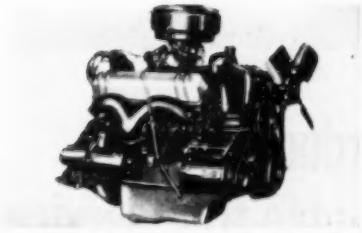
HERE'S HOW YOU SAVE WITH FORD *TRIPLE* ECONOMY

You get more truck for your money in a FORD

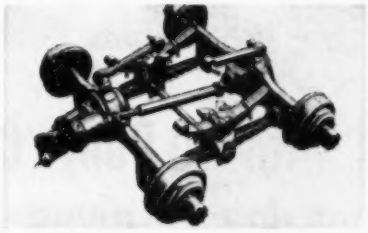
From front to rear axle, new Ford *Triple Economy* saves you money all the way

In every Ford Truck you'll find a new gas-saving, LOW-FRICTION engine. For greater driving ease, there's Ford's famous *Driverized* Cab. And every Ford has strong, low-weight chassis for money-saving load capacity. For complete information, see your Ford Dealer *today!* Or write: Ford Division, Ford Motor Co., Dept. T-12, Box 658, Dearborn, Michigan.

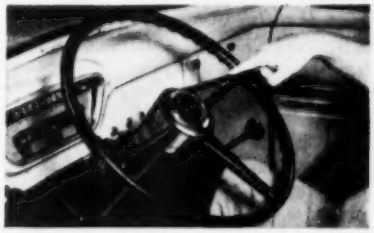
Brand new Ford factory-built T-800 Tandem-Axle BIG JOB is rated for 40,000 lbs. GVW, 60,000 lbs. GCW—gives you up to 3800 lbs. more payload than other make 6-wheelers in this class. Powered by the new 170-h.p. *Cargo King* V-8.



New Low-Friction 170-h.p. *Cargo King* V-8 gives you up to 41% more power per cubic inch than other truck engines in its class.

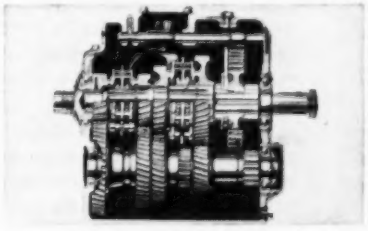


Latest design tandem axle bogie features rubber-bushed suspension and power divider with 3rd differential lockout.

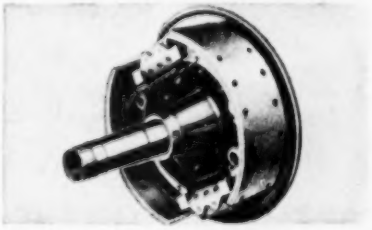


New Master-Guide Power Steering is standard on T-800. Operative at all times, it cuts steering effort as much as 75%.

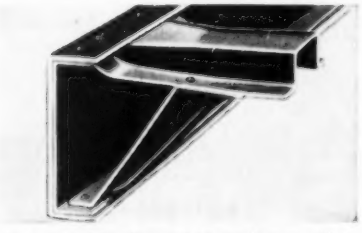
***Driverized* Cab** has big, one-piece windshield, free-breathing woven plastic upholstery, exclusive seat shock snubbers.



Heavy duty, 5-speed Synchro-Silent transmission is available in direct or overdrive. Auxiliary transmissions also available.



New T-Series has vacuum-power operated hydraulic brakes on all six wheels. Full air brakes available on the T-800.

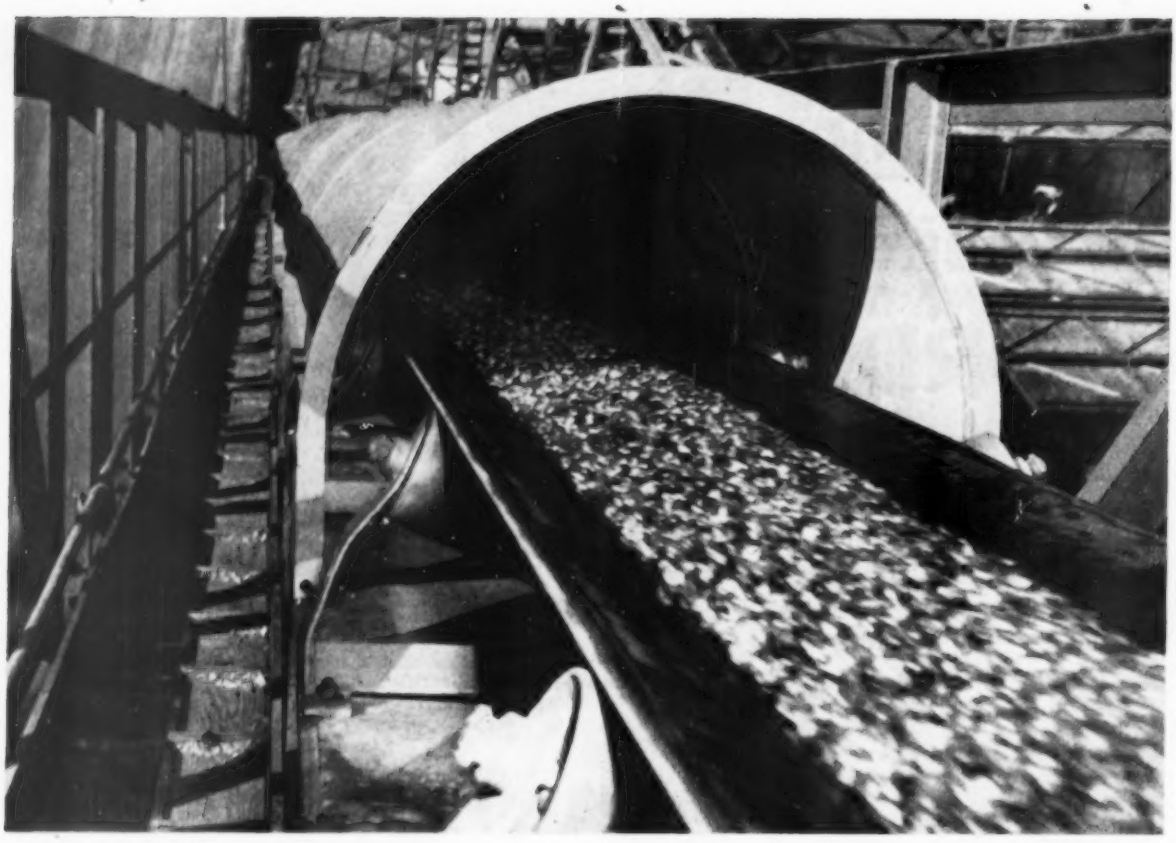


Deep, double channel frame has parallel side rails 9¼ in. deep. Reinforced from rear of front spring to end of frame.

1. Gas-Saving Power! **2.** Driver-Saving Ease! **3.** Money-Saving Capacities! *And Ford Trucks last longer!*

FORD
TRIPLE ECONOMY
TRUCKS

MORE TRUCK FOR YOUR MONEY!



Basalt Rock Company reports . . .

Belt reinforced with Du Pont "Cordura" rayon carries 1500 tons per day . . . gives trouble-free service

Crushed rock being loaded on belt underground. This 24-inch belt, reinforced with "Cordura" rayon, hugs the center idler for better training and troughing throughout its 310-foot run.

Steady production at the Basalt Rock Company, Fontana, Calif., which makes concrete pipe, depends on the performance of the conveyor belt shown above. The belt, reinforced with Du Pont Cordura* High Tenacity Rayon, is used continuously for 6 hours each day . . . and running conditions include exposure to the heat of summer, and to winter sand and dust storms.

The company reports that the "Cordura" reinforced belt has given highly satisfactory service under all operating conditions since its installation 9 months ago. It has carried an average daily load of 1500 tons of rock and sand—has needed no repair or maintenance to date.

The extra strength of Du Pont "Cordura" permits a belt that's thinner, yet stronger. And the *low stretch* of "Cordura" reduces expensive downtime for take-up and resplicing.

Write us for names of suppliers . . . and send for your free *copy of the new booklet "Mine & Quarry Facts About 'Cordura'." Address: Textile Fibers Department, Room 2528, E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Del.*

*REG. U.S. PAT. OFF.

Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

LIMA Type 44 ANSWERS DEMAND for One yard shovel and 25 ton crane

(AVAILABLE WITH CRAWLER, WHEEL OR TRUCK MOUNTING)

To meet the need for a 25 ton crane and 1 cubic yard shovel, Baldwin-Lima-Hamilton Corporation, is now producing the LIMA Type 44. As a shovel, it is equipped with 20 ft. boom and 15 ft. dipper handle. This latest addition, fills an important spot in the LIMA line, between the famous Paymaster (17½ ton crane—¾ yard shovel) and model 604 (35 ton crane—1½ yard shovel).

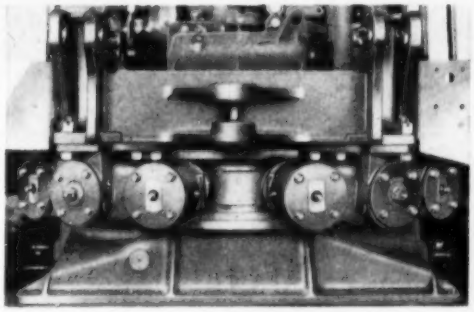
Like its smaller brother, (Paymaster, Type 34), the LIMA Type 44 is available, with either crawler or rubber mountings. Wider, longer crawlers for greater stability and double sets of front cone rollers, to distribute the load more equally over a wider area, are some of the major design features.

For your copy of our Type 44 bulletin, please contact your nearby LIMA distributor, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio.

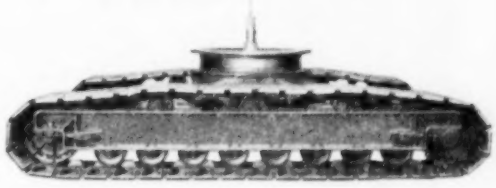
COMPARE!

No other machine gives you as much as LIMA!

1. All gears, smaller parts and shafts which are subject to extra wear, are flame or induction hardened for longer life.
2. Main machinery is placed well back of center of rotation, to eliminate excess counterweight.
3. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.
4. Big capacity drums and sheaves, lengthen cable life by reducing the need for double wrapping and sharp bends in cable.
5. Propel and swing gears and power take-off, are enclosed in a sealed oil bath for dirt elimination and smoother, quieter operation.
6. Torque converter (optional), automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster.
7. COMPARE and you'll specify LIMA for shovels, (¾ cu. yd. to 6 cu. yds.), cranes (to 110 tons) and draglines (variable).



The conical rollers are the hook type, four in front and two in the rear. The four front rollers are arranged in pairs and each pair is mounted in an equalizer frame.



An extra long Crawler (15'-0" long, 10'-8" wide), is available for work requiring greater stability.

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DRAGLINES • PULLSHOVELS

BALDWIN BLH LIMA HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

FOR A *Superior* AGRICULTURAL LIMESTONE PRODUCT

BRADLEY HERCULES MILLS

From rough to finish . . .
in one low-cost operation

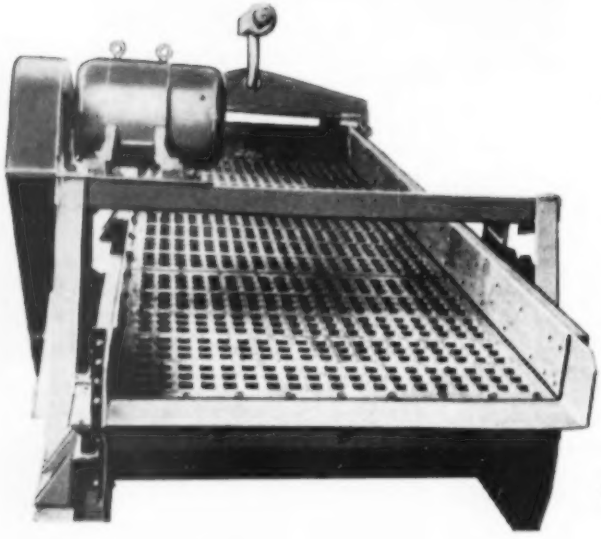
Constant progress in design and manufacture over the past 50 years has made Bradley Hercules Mills the standard pulverizer where a superior agricultural limestone product is desired. Automatic electrical feed control eliminates manual operation. Rugged, dustless construction, maximum accessibility keep maintenance costs at an absolute minimum. In sizes to meet the requirements of most any plant at moderate cost.

For complete information, write for Catalog No. 61

Bradley PULVERIZER CO.

LONDON **ALLENTOWN, PENNA.** BOSTON

Takes Rough Treatment In Its Stride



Hendrick Perforated Metal Plate takes the knocks and bruises of constant heavy-duty screening without altering uniformity of material. Because the holes can not stretch, Hendrick Perforated Plate assures large quantity screening without expensive, time-wasting blinding. And decks can be changed quick-as-a-wink! Supplied either flat or corrugated, Hendrick Perforated Metal is available in any desired shape and size of openings in high carbon, stainless steels and in other commercially rolled metals.

Write for further details — or phone Hendrick direct.

Hendrick
MANUFACTURING COMPANY
39 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

Thousands of Manitowoc 2000 owners have proved to themselves that it's the fastest, most powerful, most productive 1¼ yd. machine in its class — in fact, it will match many machines in the 1½ yd. class.

It has BIG capacity — 25 tons lift at a 12' radius. It has tremendous power at the dipper, because of simplified design — only 13 gears throughout, and each one saved adds power at the dipper. It has faster working speeds — TORQUE CONVERTER drive, if desired — rugged construction throughout, and long, wide crawlers for maximum stability.

It's big in performance, yet fast from job to job. Can be "trailered" or shipped on a flat car, without any dismantling, except if long crane boom is attached. Offers you the most versatile choice of optional equipment and attachments.

Before you buy any excavator, get complete details on this versatile Model 2000. Manitowoc Engineering Corp., Manitowoc, Wis.

FASTER CYCLES

Fast, safe operating speeds mean higher output. Compare hoist speeds as high as 216' per minute, swing 4.15 R.P.M. and travel 1.05 M.P.H. Simplified design — simplified operation, mean more yardage on any job.

Master of Many Jobs

- **LIFT CRANE, with hook block and single ship line.**

- **CLAMSHELL, with torsion spring tagline and automatic holding line take-up.**

- **DRAGLINE, with swivel type fairlead, 1¼ yd. general purpose.**

- **1¼ yd. STANDARD SHOVEL with 22½' boom, 16' sticks.**

- **HIGH LIFT 1¼ yd. SHOVEL with 26' boom, 18' sticks.**

- **TRENCH HOE with 22' boom, 12' stick, and 1¼ yd. capacity.**

MANITOWOC
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SCREENING NEWS

Helpful information on screening and separating operations ...from field reports of **SWECO SEPARATOR** *District Engineers*

Crystal Silica Ups Industry Average for Efficiency

Crystal Silica Company, Oceanside, California, upholds a quarter-century reputation for producing accurately sized grades of silica sand. Using a battery of multi-decked SWECO Separators, they turn out five different grades from minus-10 to minus-60 with 98% accuracy—compared with accepted industry standards of about 85%. SWECO installations have stepped up Crystal's screening capacity 50% in past two years. Average life of stainless steel screens is 200 days on a 24-hour, 7-day production schedule.

Barium Ore Processor Finds Double Job for Sweco

Versatility of SWECO Separators is attested by Barium Products, Ltd., Modesto, Calif., which uses the same 48" single-deck unit for dual purpose: to screen barium oxide grinding material (plus 40 mesh desired) and lamp black (minus 20 mesh desired). Changing screens, adding decks, adjusting eccentric weights give processors the flexibility they desire with SWECO.

At another processing stage, same company uses a two-deck SWECO Separator to screen 180-lb.-per-cubic-foot barite ore at throughout rate of 10 TPH at minus-10 mesh.

SWECO Engineer Reports Test on Nepheline Syenite

After testing samples of Nepheline Syenite for a Canadian client, SWECO engineer summarized: "One 48" SWECO Separator will have ample capacity to handle two tons per hour of this material on either 94 mesh or 100 mesh screen cloths. Believe two ton per hour could also be achieved on 165 mesh. If small percentage of fines can be permitted to move off screen with the oversize, capacity can be greatly increased."

Free screening analysis and recommendations...

SWECO *District Engineers are available to make detailed analyses and recommendations on specialized screening operations without cost to you.*

SEND FOR BULLETIN # 4-6

Detailed information on applications of SWECO *Screen Separators.*

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Write today for prices and free literature on our new line of Balls and Cable Weights . . . or phone for prompt delivery.

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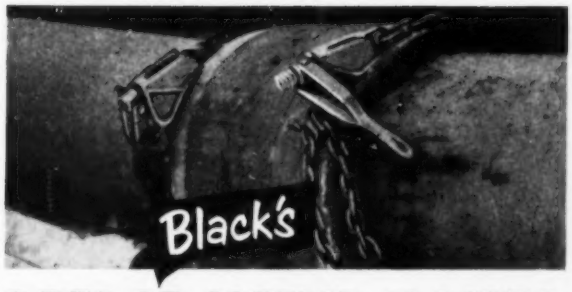

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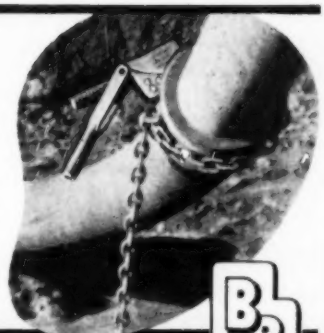
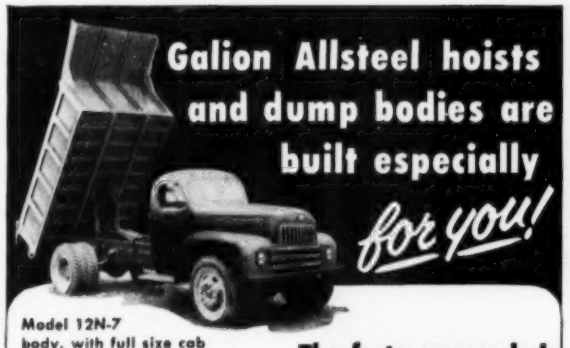


THE BLACK BROTHERS CO., INC.
9th Ave. at 4th, Mendota, Illinois



Model 12N-7 body, with full size cab protector, carries 10 yd. loads.

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• ***Dump body durability*** for any type of hauling year after year—that's what you get in today's standard Galion dump body. If you want built-in ruggedness—if you want improved tail gate operation and a new body design that is engineered to last longer—then you should buy a new standard Galion dump body.

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A-9134

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There are a thousand and one types and sizes of wire rope made by Macwhyte. Our engineers will be glad to help you get maximum service. Ask for recommendations. Call a Macwhyte distributor or write to:

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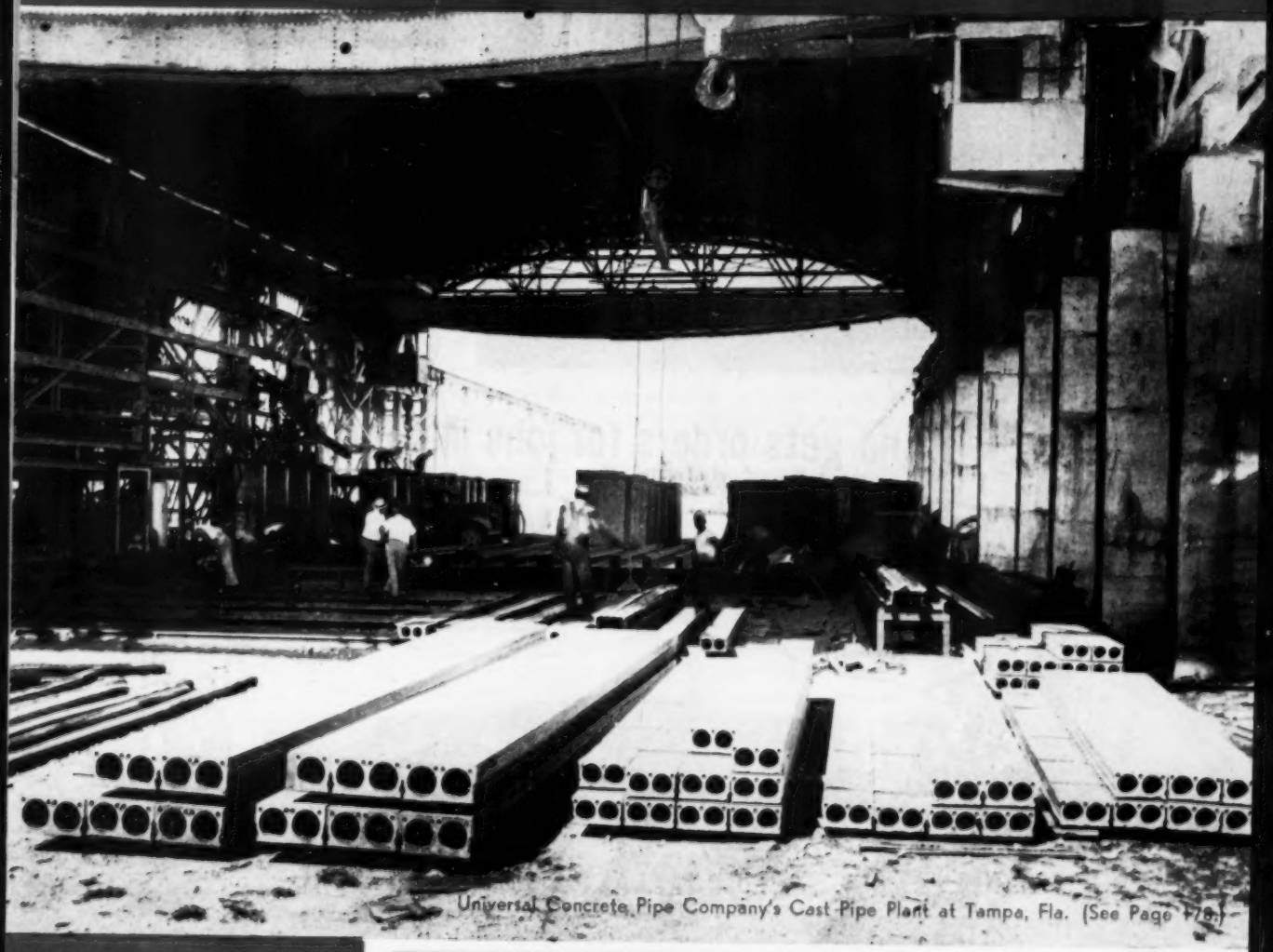
We are manufacturers of Plate Fabricating Machinery • Truck and Trailer Wheels • Mining Machinery • Railroad, Motor Truck and Industrial Scales • Products for Coal, Mining, Lead and Zinc • Smelters • Brick and Cement Plants • Rock Quarries

June 1954

THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY



Universal Concrete Pipe Company's Cast Pipe Plant at Tampa, Fla. (See Page 178)

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Virginia Cement Block Company

GETS "A MUCH BETTER BLOCK" with DURAPLASTIC*

I. E. SEPPI of the Virginia Cement Block Company, Virginia, Minn., says, "We find Atlas Duraplastic Cement reduces breakage at the machine to a minimum and produces a much better block in appearance and strength." Left, at the machine, Wilho Seppi is making Duraplastic block.

With Duraplastic you can make a more cohesive, rubbery mix that holds together better, feeds easily through machines. What's more, users report increased resistance to passage of water through finished products. No wonder Duraplastic Cement is widely preferred for concrete block, brick, pipe, drain tile and silo staves!

And gets orders for jobs like this:

"Thrifty" says:
When you can give your customers a better block... and have fewer culls and throwbacks at the same time, it really pays to insist on Duraplastic. That's why Virginia Cement Block Company uses it exclusively.
"Nifty" says:
Clean, true edges and corners of Duraplastic-made blocks helped Virginia Cement Block Company land the order for this big warehouse in Hibbing, Minn.

YET DURAPLASTIC COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

ATLAS® **DURAPLASTIC**
AIR-ENTRAINING PORTLAND CEMENT

A UNIVERSAL ATLAS PRODUCT

Makes Superior Concrete Products at No Extra Cost

UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station.

The CONCRETE MANUFACTURER

June 1954

The FHA Fracas

RECENT publicity in connection with financing and insuring operations of FHA has unquestionably shaken public confidence in a program which has for some years been one of the mainstays of the home building industry. Before we all stampede to the conclusion that the FHA revelations are just another facet of the corruption and bungling which seem to prevail in far too many branches of the government, it might be well to pause for a moment and take stock of the situation.

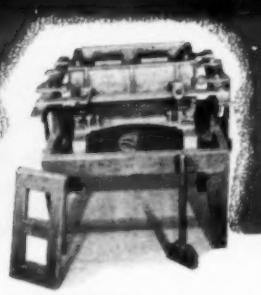
Newspapers have had a great deal to say about the so-called "Section 608 windfalls" which enabled builders whose actual costs were less than mortgage proceeds to pocket sizable sums of money to which they were not entitled. Unquestionably someone got taken to the cleaners in these transactions, and there seems little doubt that the victims were the ultimate purchasers or renters. But who are the culprits? Congress, which enacted the inept legislation? FHA, which apparently took no exception to the money pocketing operation? Or the builder, whose moral code was elastic enough to permit him to pocket an unearned and undeserved profit?

Regardless of where the principal burden of blame lies, there can be no doubt that public confidence in FHA has sustained a serious setback, and there seems to be a very real danger that the entire FHA program will ultimately suffer. This outlook is particularly regrettable in view of the negligible magnitude of the irregularities which have been brought to light, for the charges appear to cover not more than 1/10 of 1 percent of the total FHA mortgage insurance program. If the situation proves to be no worse than this, it strikes us that the findings of the Senate Banking Committee could quite properly be construed as furnishing abundant evidence of the inherent soundness and integrity of FHA and the overwhelming majority of its personnel.

If the entire Federal Housing Administration were directed and manned by deacons and senior church wardens, we doubt very much if it would be reasonable to expect simon-purity in excess of 99.9 percent. We hope that the Banking Committee will take prompt steps to see that all rental housing sections under FHA will have anti-mortgaging-out clauses under which excess of mortgages over audited costs would have to be applied to loan principals. But even more particularly, we hope that means will be found by the Committee to undo at least some of the damage which one-sided publicity has inflicted upon a valuable adjunct of the housing industry.

William M. Avery

Another BESSER Booster ★



The first concrete block machine designed and built by Besser and purchased by John Nagy.

★ This is the 109th of a series of ads featuring leaders in the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

John Nagy, a "Daddy" of the Concrete Block Industry and founder of Columbia Concrete Products, Inc.

NAGY and BESSER Celebrate 50 Years of Cordial Business Relationship!

Back in 1904, John Nagy, founder of Columbia Concrete Products Inc., Toledo, Ohio, bought the very first block machine manufactured by Besser. This early hand-operated model used cored pallets. Production totalled 300 units per day, using 2 men on the machine and 1 mixer man.

Now, 50 years have gone by and during this time both Columbia Concrete Products and Besser have made tremendous progress. Whenever Nagy required more block machines, he installed Besser equipment . . . first a tamper with 1500 per day production . . . then an automatic stripper producing 3000 units per day. This was followed by several three-at-a-time Vibrapacs and more recently a six-at-a-time Vibrapac with its 10,000 per day production record.

Joe Nagy, President and General Manager, states **"We relied on Besser equipment and found it to be the best. It always produced up to expectations".** Frankly, isn't it significant that the Nagys always came back to Besser when the ever-increasing demand for concrete block necessitated the installation of additional block machines?

BESSER MANUFACTURING COMPANY

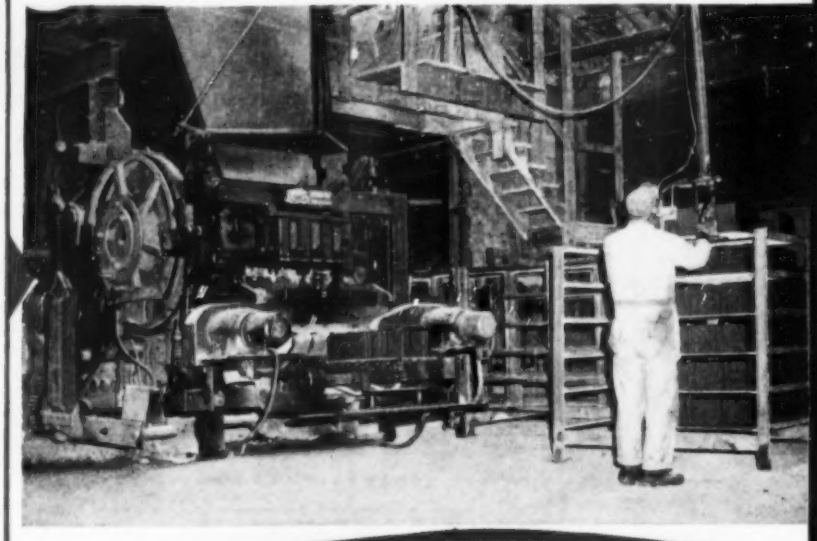
BOX 131 • ALPENA, MICHIGAN, U.S.A.

Complete Equipment for Concrete Products Plants

Two sons of John Nagy inspecting Vibrapac Block. Joe (at right) is President and General Manager.

Storage yard at one of the plants. Note Vibrapac Block piled three cubes high. Columbia is one of the largest block producers in the Middle West.

St. Charles Hospital, Toledo, Ohio, recently completed. Columbia Concrete Products furnished 3", 4" and 6" hollow cinder units as well as cinder and cement solid brick.



Interior view of one of the Columbia plants showing a Besser Vibrapac in operation. Three 8 x 8 x 16 modular block produced at a time on one Plain Pallet. Smaller sizes, in equivalent multiples, on the same Plain Pallet.

BESSER 50th Anniversary 1904-1954

A Half Century of Concrete Masonry Progress!

NEWS OF THE CONCRETE INDUSTRIES

Ready-Mix Now Exempt—Renegotiation Board Acts To Reverse Earlier Stand

Good news for the ready-mixed concrete producers was made known in an official communication from Vincent P. Ahearn, executive secretary of N.R.M.C.A., revealing that ready-mix has been exempted from renegotiation.

When earlier efforts of the association to persuade the Renegotiations Board to exempt ready-mixed concrete were without avail, a selected group of N.R.M.C.A. members identified themselves with the consideration of H.R. 6287, now pending, which proposes the extension of the Renegotiation Act. (Technically, the Act expired December 31, 1953, but Congress will extend its life.) Frank P. Spratlen Jr., a former president of N.R.M.C.A., presented the association's case for exemption to Senator E. D. Millikin and Senator Johnson, both members of the Senate Finance Committee.

Favorable action of the Renegotiation Board was indicated in a telegram to the two senators, and later confirmed by a letter from George C. McConnaughey, chairman, to Senator Millikin. According to these communications, "ready-mixed concrete is entitled to exemption as a raw material pursuant to section 106(a)(3) of the (Renegotiation) Act". The board's action establishes exemption of ready-mix for the entire period of the Act, which became effective on January 1, 1951. The effect of its statement, according to Senator Millikin and Senator Johnson, "is to be considered retroactive".

Cleveland Engineers Hear Address by R. E. Copeland

R. E. Copeland, director of engineering of the National Concrete Masonry Association, recently presented an address on the subject *Design and Construction of Concrete Masonry Structures* before the 1954 Construction Conference sponsored by the Cleveland Engineering Society.

Standard specification requirements for concrete masonry units and mortars, the structural characteristics of concrete masonry walls, and the development of proper working stresses and design practices were the topics covered in the address.

Coming Events

June 13-18, 1954—Chicago. Annual meeting, American Society for Testing Materials. Eleventh exhibit of testing and scientific apparatus and laboratory supplies and ninth technical photographic exhibit. Sherman and Morrison hotels.

June 20-27, 1954—Brussels. International congress of concrete products manufacturers.

August 24-25, 1954—Murray Bay, Quebec. Directors' meeting. National Ready Mixed Concrete Association. Manoir Richelieu.

Burns & Russell Company, Baltimore, Md., is licensing manufacturers to produce colored glazed facings for concrete block which are also "stain-proof". According to J. Glenn Whitman, executive vice-president of the firm, ink, iodine, dyes, and lipstick will not cause a permanent stain on these facings.

Anchor Concrete Products Installs Outsize Autoclaves At Buffalo, N.Y., Plant

Anchor Concrete Products, Inc., Buffalo, N.Y., has initiated the use of the "pressure cooker" method of curing concrete building block with equipment costing about $250,000.

President Frederick W. Reinhold stated that an additional $150,000 will be spent in the next several years for other units for this process. He added that curing time now has been cut from weeks to 12 hours.

Block are placed in one of three 10- by 90-ft., 60-ton cylinders for curing. Upon removal after 12 hours the units are ready for immediate delivery. Under the previous methods, said Mr. Reinhold, they were placed in kilns for 24 hours and then stored in the yard to cure for a month or more. According to Mr. Reinhold, the autoclaves are the largest of their type ever made and the first to be installed in western New York.

Carl A. Bluedorn, president and general manager of the Zeidler Concrete Products Company, Waterloo, Iowa, was installed as treasurer of the Iowa Engineering Society at the latter's 65th annual meeting.

• Officers and directors of the New York State Concrete Masonry Association, who gathered with other members at the Commodore Hotel in New York City on May 7 for their semi-annual meeting. Front row: Frederick W. Reinhold, Buffalo, director; Harvey H. Black, Rochester, president; and Garson Dinaburg, Binghamton, past president and now a director. Standing: William Homer, Syracuse, director; Grant L. Reinhold, Buffalo, secretary; John D. Daly, Auburn, treasurer; Arnold Cogswell, Troy, director; and Robert Abbey, Buffalo, executive secretary. Other officers are George Kogel, New York, vice-president; and Henry C. Quaritius Jr., Brooklyn, director.

Rx Ready Mix

By Harry F. Thomson

Drug Store Concrete

WE have all heard the comment, "Good concrete is made of cement, sand, and aggregate; poor concrete is made of the same materials."

There was a time when production of concrete was just that simple—any portland cement, any convenient sand, and any available aggregate mixed in roughly measured proportions by volume of 1 to 2 to 4 parts, with whatever quantity of water the operator fancied to use. There was no requirement of fines, no limit to top size, no reference to grading or durability or organic impurities, and no concern about water-cement ratio.

Those were happy days for the concrete producer; but unfortunately much of his concrete varied widely in strength and other properties. This fact did not promote durability and denied the claim for "permanence", although it must be said that some of that uncontrolled concrete, especially that which was mixed so stiff it had to be pounded into place, did give good life service.

Today, however, a responsible producer must pay careful attention to the materials he uses. The greater emphasis now directed to accurate proportioning of specification materials according to design is producing concrete with more reliable predetermined characteristics, such as strength, permeability, and durability.

Today a responsible producer must pay careful attention to the materials he uses. As for cement, most construction requires only regular portland, classed as Type I. As there is considerable variation among different brands of cement, even though all meet the standard specifications, the producer should be familiar with the performance of the brand or brands which he uses; this is particularly important if he is furnishing concrete on a strength basis.

Type I cement which contains an interground air-entraining agent is known as Type I-A. However, the producer may have frequent calls for high-early-strength cement, Type IV, which he must be equipped to furnish; and in some areas Type II cement is commonly required for certain work, especially for sewer construction. In addition, there are two other standard types, which are commonly used only on very large projects.

For aggregates an individual concrete producer is dependent largely on materials available on the local market; but for uniform and high-quality concrete, he must check continually on the physical characteristics of his material. Dirty, organic, soft particles are, of course, objectionable. In crushed materials long slivers are undesirable. Maximum size is usually governed by the character of the construction; in many markets three or four sizes are available. Grading, as measured by standard screen sizes, should be almost along a straight line. For paving, many state highway departments require coarse aggregate furnished in two sizes, to minimize segregation from handling. Some natural sands are deficient in fines, in which case blending with a very fine material, possibly a lake sand or a natural loess, may be necessary. The use of just any sand or any coarse aggregate which is offered, is not good practice unless regular checks are made on the characteristics of the material delivered.

The quality of water for mixing is seldom a serious problem, as any water that is potable can be considered satisfactory. The big problem with reference to water is the determination of the correct quantity to be added to a batch of given materials. But that is another story which belongs under design, and is not pertinent to the present discussion of materials.

However, the materials problem does not end at this point. The frequent desire to give concrete some special or improved characteristic, other than that resulting from normal quantities of the basic materials alone, has resulted in extensive use of one or more additional materials, commonly termed "admixtures" (or "admixes" for short). Sometimes the quantities used are relatively minute, possibly only a few ounces per cubic yard (approximately 2,000 lb.) of concrete; but the resulting change in some characteristic of the mass may be very significant. The extent of the use of admixes has expanded greatly in recent years, even to the point that many commercial producers use an admix in all of their concrete. Some plants which are using certain admixes extensively have installed special bins for dry storage, or tanks with agitators for solutions, to maintain uniformity, and devices for automatic measurement.

The following list indicates the types of materials used as admixes more or less frequently to accomplish special characteristics:

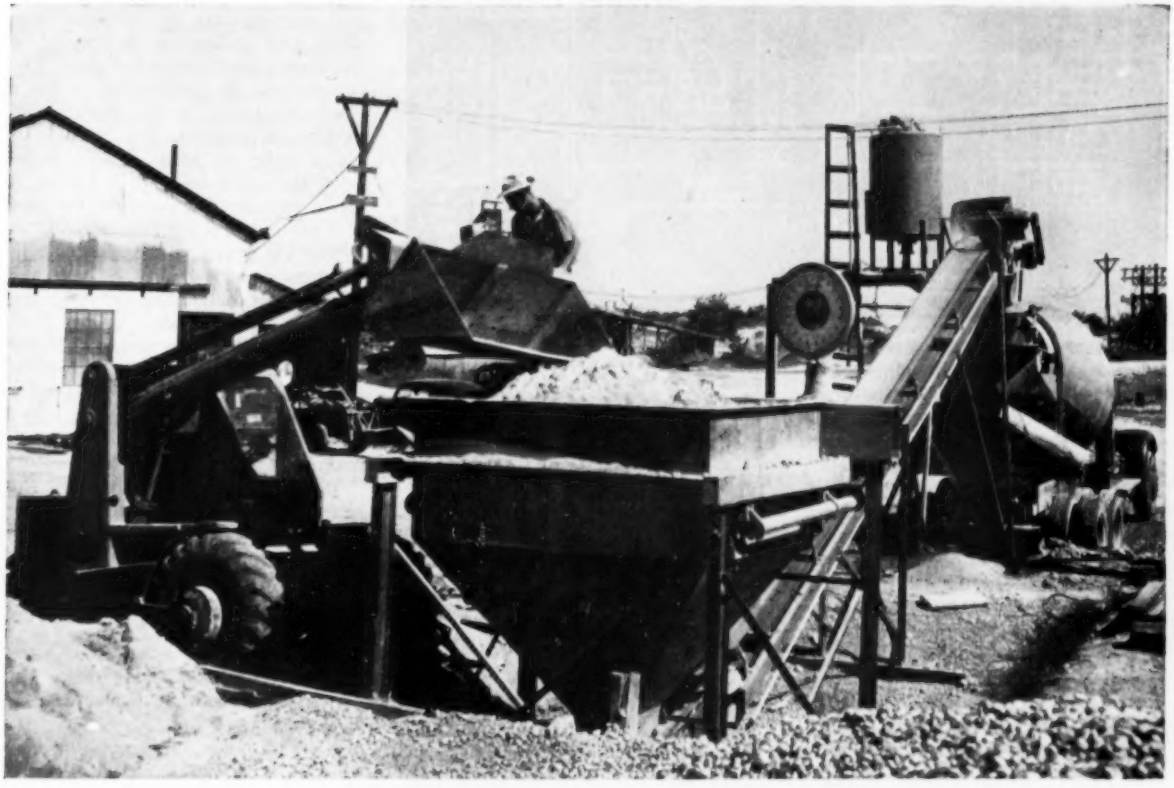
Accelerators, such as calcium chloride, to speed up setting
Retarders to overcome early stiffening
Air-entraining agents, such as detergent materials and certain by-products of the paper pulp industry
Gas-forming agents, such as aluminum powders.
Diffusing agents (so-called), which reduce surface tension
Cementitious materials, such as natural cement and lime
Puzzolanic materials, such as certain volcanic ashes (natural) and certain fly ashes (artificial)
Alkali-aggregate expansion reducers
Damproofing and permeability-reducing materials
Workability agents, such as finely-divided inert powders and wetting agents (air-entraining).

Many products of the types listed are sold under proprietary names, and their respective functions can be identified only by the manufacturer's claims. Some materials could be classified under more than one of the above types; for instance, a widely used diffusing agent was originally offered as an integral waterproofer, but that function has not been emphasized in recent years. Also, a typical effect of an admix in changing the character of concrete is that purposely entrained air increases workability markedly. The above list is not complete, as prod-

(*Continued on page* 174.)

PORTABLE CONCRETE EQUIPMENT

DESIGNED FOR SMALL TOWN, SUBURBAN AND ON THE JOB BATCHING OF CONCRETE, ALSO PROJECT BATCHING



AS YOU CAN SEE BY THE PRICES BELOW, A PLANT WITH ONE TRANSIT MIXER AND TRUCK CAN BE HAD FOR AS LOW AS $11,265, AND THE ONLY ADDITIONAL EQUIPMENT NEEDED WOULD BE A FRONT END LOADER AND TRACTOR SUCH AS FORDSON WHICH DELIVERS IN MOST PARTS OF THE U. S. FOR $2,350.

This plant comes in 15,000, 20,000, and 30,000 lb. sizes for batching 3-4-5 and 6 yard transit mixers.

They are equipped with 40 ft. by 24 in. belt conveyors capable of batching the largest mixer trucks under any local conditions.

Self powered conveyor, either gas or electric power. Water measuring equipment consists of tripple tank or Neptune water meter.

The hopper is 8 ft. square or less, so that it can be transported from one town to another on the highway and comes in 4, 5 and 6 yd. sizes.

COMPLETE PLANT WITH MOTOR CONVEYOR, WATER METER & SUPPORTING STRUCTURE

15,000 lbs. 4 yard $5,150

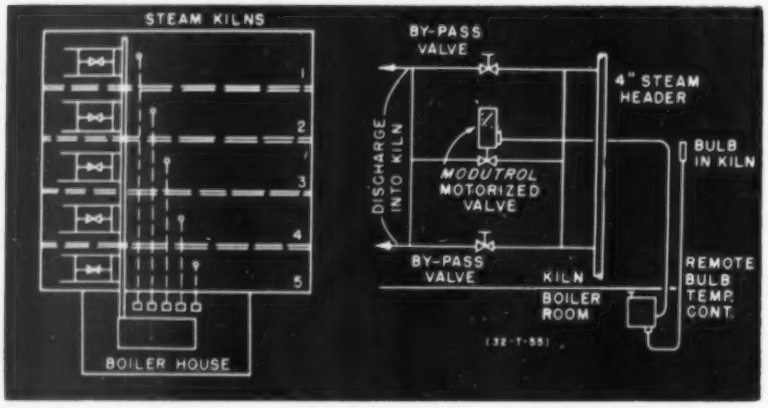
20,000 lbs. 5 yard $5,250

30,000 lbs. 6 yard $5,350

AL WILLIS SALES COMPANY

1620 Syracuse, Denver 8, Colo. Telephone EAst 0726

Centrally Mounted Kiln Controls Guarantee Proper Block Curing



● Diagram of the steam kilns and temperature controls at the Graystone Concrete Co. block plant, Seattle.

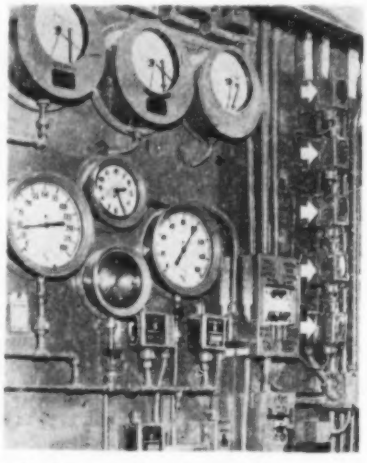
THE use of steam kilns with automatically-controlled temperature during the curing cycle has enabled Graystone Concrete Company, Seattle, Wash., to turn out a uniform product of consistent high quality. The company utilizes five 12½-ft. wide by 60-ft. long kilns, each of which has its own temperature control devices.

The control system consists of five remote bulb proportioning temperature controllers and matching spring-return Modutrol motorized valves, supplied by the Minneapolis-Honeywell Regulator Company (Industrial Division). The controllers are mounted in the boiler room at one end of the plant (see photo); each has capillary tubing long enough so that the entire set can be mounted one above the other, with the bulb located in the kiln to be controlled. Each motorized valve in turn is mounted in the feeder steam line serving each kiln; it serves to throttle the steam flow at the command of the controller in proportion to the temperature variation.

The operation of each controller-valve combination is regulated from a separate toggle switch. When the switch is turned off, a spring causes the valve to return to a fully-closed position, thereby completely cutting off the steam.

In actual operation, after the toggle switch is turned on, the motorized valve opens at the command of the controller. Temperature gradually builds up in the kiln, reaching the set point of the controller; then the valve automatically throttles the steam flow, allowing just enough steam to enter in order to maintain the desired temperature. This temperature is automatically maintained until the end of the steam-curing period, at which time the toggle switch is turned off. Following the cooling-off period, the doors are opened, and the block are removed.

According to E. G. Lowry, Graystone engineer, the control system has given outstanding and profitable service for the last several years. He states that installation is simple, operation easy, and maintenance negligible.



● Block curing is automatically controlled from this kiln control panel. The arrows (right) point to temperature controllers, one serving each kiln.

An interesting item will be made at a plant supervised by the Vicksburg (Miss.) District of U. S. Engineers, which will soon produce articulated concrete revetment mats designed to reinforce and stabilize the Mississippi River banks. A plant costing about $1,000,000 is being built south of Greenville, Miss.

Committee of M.C.A.A. Reveals Scope of Study Of Handling, Packaging

In its monthly report the Technical Research and Development Committee of the Mason Contractors Association of America outlined briefly the scope of its present study and investigation of material handling and packaging, as applied to the mason contracting industry. The committee, in accordance with a resolution passed at the annual convention, is assuming that the 24- by 32-in. pallet or unit is basic; however, the advisability of breaking it down into smaller packages for ease of handling is being considered.

The Committee indicates that it is not now directly concerned with the problems of palletizing *vs.* unitizing, but is concentrating on making known the requirements of the mason contractor to the manufacturer and material dealer. The program of the committee is not devoted to any one specific material, but encompasses all masonry materials.

W. A. Ouweneel, chairman of the committee, announced that an all-industry forum on the subject of materials handling and packaging problems would be held soon.

Rx R.M.C.

(*Continued from page* 172)

ucts with special characteristics appear on the market from time to time. Nor does this list include the variety of color pigments, hardeners, waterproofers, abrasives, and other items which are commonly used in topping mixes, nor the types of surface curing compounds for use on structures in place.

The foregoing comments assume the use of "heavy aggregates" only, i.e., gravel, crushed stone, or crushed slag. The producer must also consider the rapidly growing interest in lightweight concrete, both structural and insulating. This field requires familiarity with the characteristics of expanded clay or shale, expanded slag, pumice, perlite, vermiculite, and other related materials. Some of these may be offered to the trade under proprietary names.

These are some of the complications concerning materials which confront a producer who today undertakes to supply the gamut of requirements of miscellaneous concrete construction. Such complexity, involving a wide range of materials and measurements of quantities from ounces to tons, has occasioned the remark that present-day production represents the manufacture of "Drug Store Concrete".

N.R.M.C.A.'s Survey Report Shows Industry's Progress

THE following report was issued recently by Kenneth R. Tobin Jr., assistant executive secretary of the National Ready Mixed Concrete Association:

The National Ready Mixed Concrete Association's third annual survey of the production and value of ready-mixed concrete is a continuation of the association's effort to measure the contribution which this industry makes each year to the national economy. Returns were received from 981 ready-mixed concrete companies—457 member companies. There were returns from 50 percent of the companies to whom questionnaires were sent; the return from member companies was 79 percent and from non-member companies, 36 percent. Statistics were also available on 122 member companies which did not return the questionnaire. These statistics have been incorporated in the study, making a total participation of 1,013 firms.

The three tables reflect the results of the survey of ready-mixed concrete activity in 1953. Table 1 shows that the reporting companies produced 53,404,513 cu. yd., valued at $636,482,350, with an average value of $11.92 per cu. yd. The results of the 1951 and 1952 N.R.M.C.A. surveys are given for comparison.

Reporting ready-mixed concrete producers used more than 36 million tons of sand, almost 53 million tons of coarse aggregate, and more than 71 million barrels of portland cement. The average production was 52,719 cu. yd.; the median production was 25,785 cu. yd. Average consumption of portland cement per cu. yd. of concrete was 1.33 bbl.; average consumption of sand was .67 tons per cu. yd.; and average consumption of coarse aggregate was .98 tons per cu. yd.

Table 2 is an analysis of the distribution of ready-mixed concrete production in 1953 by size of company, based on returns from the 1,013 companies. The largest number of companies are in three brackets: (1) 0-10,000 cu. yd., 185 companies, responsible for 2.1 percent of the total production; (2) from 10,000 to 20,000 cu. yd., 220 companies, responsible for 5.9 percent of the total production; from 20,000 to 30,000 cu. yd., 169 companies, responsible for 7.8 percent of the total output.

Nine companies produced over

(Continued on page 188.)

Table 1—Ready Mixed Concrete in 1951, 1952 and 1953

	1951	1952	1953
Companies surveyed	1635	1625	1791
Companies reporting*	691	942	1013
Production (cu. yd.)	37,760,191	49,169,443	53,404,513
Total value	$424,136,796	$564,861,162	$636,482,350
Portland cement (bbl.)	50,873,199	62,297,152	71,082,222
Sand (tons)	27,218,748	29,844,257	36,064,847
Coarse aggregate (tons)	35,911,177	46,290,076	52,452,610
Average** production (cu. yd.)	54,646	52,197	52,719
Median** production (cu. yd.)	27,400	26,455	25,785
Average value (per yd.)	$11.23	$11.49	$11.92
Average portland cement (bbl. per yd.)	1.35	1.27	1.33
Average sand (tons per yd.)	.72	.61	.67
Average coarse aggregate (tons per yd.)	.95	.94	.98

*1953 total includes 122 member companies not actually replying to the questionnair but whose reports were otherwise available.

**The average production was determined by dividing the toal production by the number of reporting companies; the median production is that of the "middle" company—i. e. in this sample of 1,013 companies, the 507th company from the top.

Table 2—Distribution of 1953 Ready Mixed Concrete Production by Size of Company

1953 Production (Cu. Yds.)	No. of Companies	Cubic Yards Produced	Percent of Reported Production	Percent of Participating Companies	Accumulated Percents of Totals: Total Production	Accumulated Percents of Totals: Total Companies
0- 10,000	185	1,141,205	2.1	18.3	2.1	18.3
10,000- 20,000	220	3,150,533	5.9	21.7	8.0	40.0
20,000- 30,000	169	4,168,774	7.8	16.7	15.8	56.7
30,000- 40,000	87	3,029,793	5.7	8.6	21.5	65.3
40,000- 50,000	74	3,266,174	6.1	7.3	27.6	72.6
50,000- 60,000	55	2,962,281	5.5	5.4	33.1	78.0
60,000- 70,000	37	2,394,798	4.5	3.7	37.6	81.7
70,000- 80,000	33	2,454,760	4.6	3.2	42.2	84.9
80,000- 90,000	26	2,222,195	4.2	2.5	46.4	87.4
90,000-100,000	13	1,244,922	2.3	1.3	48.7	88.7
100,000-125,000	35	3,879,593	7.3	3.4	56.0	92.1
125,000-150,000	14	1,997,821	3.7	1.4	59.7	93.5
150,000-175,000	13	2,108,779	3.9	1.3	63.6	94.8
175,000-200,000	10	1,877,906	3.5	1.0	67.1	95.8
200,000-250,000	8	1,852,415	3.5	.8	70.6	96.6
250,000-300,000	11	2,964,998	5.6	1.1	76.2	97.7
300,000-400,000	10	3,376,117	6.3	1.0	82.5	98.7
400,000-500,000	4	1,797,985	3.4	0.4	85.9	99.1
over 500,000	9	7,513,464	14.1	0.9	100.0	100.0
Totals	1,013	53,404,513	100.0	100.0	.....	.....

Table 3—Equipment and Plants in the Ready Mixed Concrete Industry

Type	Number of Companies Reporting	Number of Units Reporting	Average Number of Units per Company
Mixers or agitators	891	12,705	14.3
Central mixing plants	329	431	1.3
Proportioning plants	635	1,082	1.7
Non-agitating units	891	1,604	1.8

Average number of mixers or agitators per plant reported above—8.4.

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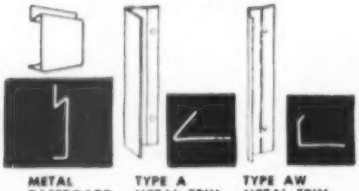
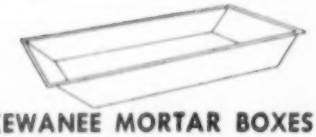


METAL BASEBOARD | TYPE A METAL TRIM | TYPE AW METAL TRIM



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● Thirty-two years of safe truck driving is represented by these four employees of Dravo Corporation's Keystone Division. They have received lapel pins and cash awards for their safety records while driving ready-mix concrete mixer trucks. From left: William Farmer and Wayne Noss, Rochester, Pa., plant; Arthur Wallace and Edwin Frair, South Side (Pittsburgh) plant. Two other drivers, C. A. Paris and Andrew Gavula, not in this picture, received similar awards.

Lock Joint Pipe Company Making Pipe at Israel Plant

At a new concrete pipe plant built in Israel by the Lock Joint Pipe Company of Orange, N. J., pipe worth $30,000,000 will be manufactured during 1954, according to a statement made by Hendrik van Renssalaer, vice-president of Lock Joint.

Mr. Van Renssalaer stated that his firm had built the "world's largest concrete pipe manufacturing plant" in Israel at a cost of $1,600,000, and that it would erect two more pipe plants, costing about $250,000, to supply critically needed water.

Maule Industries Invests Over $4,000,000 to Buy Florida Plants, Properties

In two transactions involving several millions, Maule Industries, Inc., Miami Beach, Fla., recently acquired properties which will constitute a major expansion move.

Company reports show that Maule paid $3,077,000 for the Miami Crushed Stone Company, the Peninsular Concrete Company, the Material Sales Corporation, and Tropical Farms. In a later deal the company gave $1,339,743 for the operating assets of the Alfred Destin Company, the Destin Block Company, and other assets owned by these companies.

It was stated that Maule acquired 940 acres of quarry lands through the purchase of Tropical Farms and the Destin companies. In addition the firm bought 2,195 acres in Dade and Broward counties. These acquisitions provide the company with rock reserves in excess of 100,000,000 cu. yd. At the present rate of output Maule will have reserves for 30 years.

J. C. Helms, president of the Helms Concrete Pipe Company, Inc., Alexandria, Va., died on March 6 at his home after an illness of several months. Mr. Helms founded the pipe firm in 1935.

The Catsman Concrete Pipe Company has been awarded a $213,225 contract for a year's supply of sewer pipe by the city commission of Flint, Mich.

● **Birthday Party**

Block makers, trade association representatives, and the townspeople of Alpena, Mich., on May 21 helped to celebrate the 50th anniversary of the founding of the Besser Manufacturing Company. The occasion also marked the 72nd birthday of Jesse H. Besser, president of the company which bears his name. The program included conducted tours of the Besser plant, pictured above, a testimonial dinner attended by some 700 guests, and ground-breaking ceremonies at the site of a special building soon to be erected for the purpose of teaching correct methods of manufacturing and using concrete block. In his remarks to the banquet group Mr. Besser expressed the firm conviction that within five to ten years the annual output of block in this country may soar to as many as 6,000,000,000 units if producers will unfailingly maintain rigid and constant control of all phases of their manufacturing processes.

L. G. McDiarmaid Named To Post of President Of Vermiculite Institute

L. G. McDiarmaid

At the 13th annual convention of the Vermiculite Institute, held at Coronado, Calif., L. G. McDiarmaid, vice-president of Insulation Industries, (Canada), Ltd., Vancouver, B.C., was named president. He succeeds J. B. Lyall, Vermiculite-Northwest, Inc., Spokane, Wash. E. R. Murphy and W. J. Bein, both of Chicago, were re-elected treasurer and managing director, respectively.

Keynote speaker on the first day (March 29) was Mr. Bein, and Dr. W. D. Pew, University of Arizona, was the guest speaker. During the discussions on vermiculite concrete the following day machine application, concrete roof decks, and vermiculite-asphalt roof insulation were the topics covered by the speakers. Vermiculite plaster was discussed on the third day; and the closing sessions were devoted to talks on vermiculite insulation.

The annual banquet of the institution was also held during the convention. Other special events included a boat ride in San Diego harbor and the annual golf tournament.

Empire State S.G.-R.M. Assn. Holds Third Annual Meeting

The third annual meeting of the Empire State Sand, Gravel and Ready Mix Association was held on May 10 and 11 in Buffalo, N. Y.

At the first technical session *Application of the Principles of Percentage Depletion for the Sand and Gravel Industry* was discussed by Paul J. Kremer, Buffalo Slag Company, and H. H. Kirwin, Eastern Rock Products, Inc., Utica. This meeting was followed by a presentation and discussion of materials-handling equipment under the sponsorship of the associate members.

Other speakers included Senator Walter J. Mahoney, majority leader, New York State Legislature; Paul R. Jones, Gates-McDonald & Company, unemployment consultants; Alfred B. Hoftiezer, safety supervisor, Laverack and Haines, Inc.; and Russell P. Mumford, Beckley & Myers, Springfield, Ohio. (Mr. Mumford's company received the N.R.M.C.A. 1953 Class C safety award.)

Those attending the meeting visited three plants, those of the Federal Portland Cement Company, George C. Frey Ready Mixed Concrete, Inc., and Gravel Products Corporation.

Arthur P. Clark Wins Award For Work on Reinforcing Bar

Arthur P. Clark, research associate for the American Iron and Steel Institute at the National Bureau of Standards, Washington, D. C., recently received the 1954 Award of the Concrete Reinforcing Steel Institute. Mr. Clark won the award for his contribution to the development of the A-305 type of reinforcing

● A. P. Clark (left) receiving C.R.E.I. Award from E. J. Wheeler, award committee chairman.

bar—the bar now recognized as the American standard for use in present-day reinforced concrete construction.

Mr. Clark is a member of the American Society of Civil Engineers and has authored a number of technical papers which have been published in the *Journal of the American Concrete Institute*. He is presently a member of the board of directors of A.C.I.

Advance Cast Stone Co. Gets Marblox Franchise

Marble Face Blocks, Inc., Kenilworth, N. J., has granted a franchise for the local manufacture and sale of "Marblox" to the Advance Cast Stone Company, 532 East Nash Street, Milwaukee, Wis.

The product is a 100 percent concrete unit with a smooth, shiny, colored face which permits the erection of a finished load-bearing wall in one masonry operation.

R. Neil Christy, who was formerly vice-president of engineering for the Marietta Concrete Corporation at Parkersburg, W. Va., has been named vice-president and general manager of the Marietta plant at Hollywood, Fla., which produces silos, Inter-loc mortarless block, and other items.

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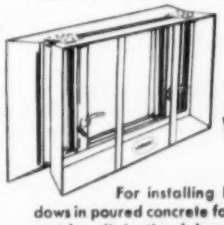

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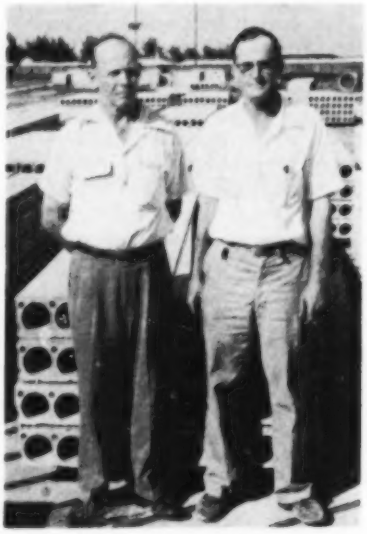
Universal Concrete Pipe Company's Tampa-St. Petersburg Operations

another ON THE SPOT report

AMONG the 21 concrete pipe plants operated by the Universal Concrete Pipe Company, a subsidiary of the American-Marietta Company, two are located in the Tampa-St. Petersburg area in Florida. One plant (Hooker's Point) produces both cast pipe and Flexicore floor and roof slabs; it is said to be the largest cast pipe plant in the South. Built in 1949 on the site of a former concrete ship-building yard on Tampa Bay, the installation features a layout unique to the concrete industry. (See cover photo.) The second plant, located in the southern part of St. Petersburg, is a new machine tamped-pipe installation which began operating a year and a half ago. Both plants are well-laid out and efficiently operated. Their products are marketed in much of the northern half of the state, particularly along the Gulf Coast.

By KENNETH A. GUTSCHICK

The cast pipe plant was set up specially to supply Tampa's $10,000,000 modern master sewage system, which was constructed in 1949. The project called for the use of tongue-and-groove concrete pipe in 8-ft. lengths, ranging in diameter from 27 to 84 in., and fitted with rubber joints. Upon the completion of this mammoth project (3½ years) the Hooker's Point plant continued production on a permanent basis, shipping its product to new markets in the Gulf coastal area. The plant still fabricates pipe in 8-ft. lengths, but in diameters ranging from 24 to 135 in.

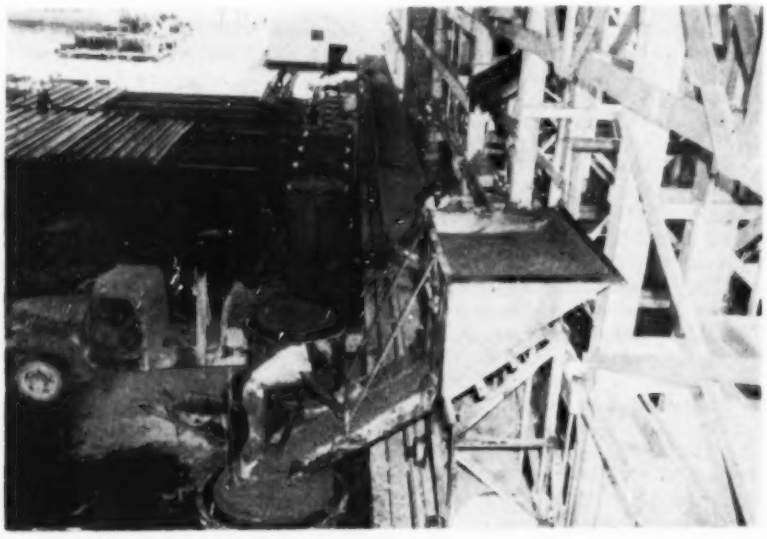


• I. A. Heinzman, former manager of Universal Concrete Pipe Company's Tampa-St. Petersburg plants (left), and Guy Manning, Tampa plant superintendent.

In setting up the plant, Universal re-converted and modernized the facilities at the McClosky shipyard, which had been used for constructing concrete Liberty ships during World War II. The old plant consisted primarily of a 75- by 200-foot hangar-type building, equipped with two overhead cranes: the company installed new material-handling facilities, bins, and mixing equipment, as well as an open 200-ft.-long crane runway used for pipe storage. Cast pipe is produced at one end of the building, Flexicore (which was added to the production line during the spring of 1952) at the other end.

Sand and gravel and bagged cement are brought in by rail, the aggregates being unloaded into four 90-ton steel bins by a Lima Paymaster 1-cu. yd. crane. The materials are proportioned in travelling weigh batchers (one used for aggregates and one for cement) and fed to a Universal 52-cu. ft. paddle-type mixer; the minimum of 5 minutes' mixing time is used. The mix is transferred via a skip hoist and chute to an electrically-operated travelling concrete buggy of 1-cu. yd. capacity, which is mounted on double rails extending the full length of the building. The pipe forms, with reinforcing cages, are assembled in a row paralleling the buggy runway. To facilitate pouring, a circular steel lid is placed on top of each form; this distributes the concrete evenly. During the pour the forms are vibrated with Jackson heavy-duty electric vibrators, positioned both internally and externally. Following the pour, the machine-tooled bell is placed.

• Right: Pouring 36-in. cast pipe at the Tampa plant, using an electrically-operated buggy. Flexicore is being made in the background.



• M. Fletcher, superintendent, St. Petersburg plant, testing concrete pipe.

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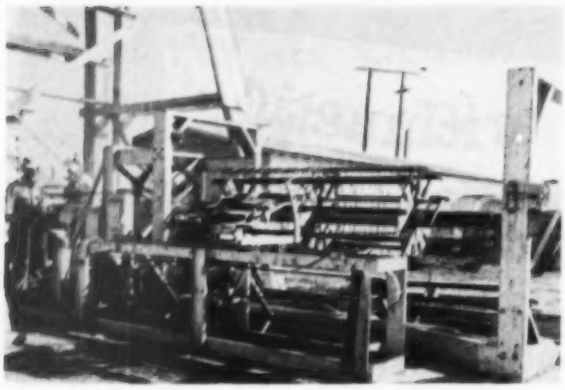
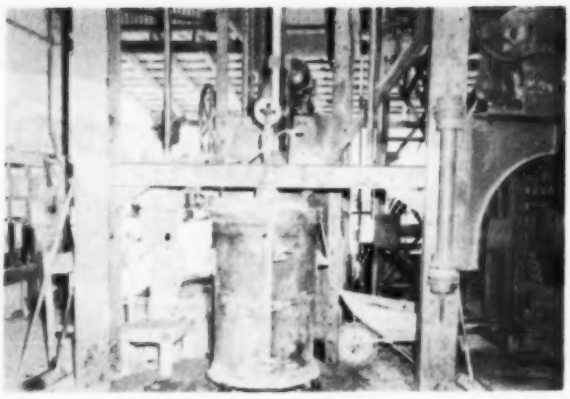


• The spiral winding machine used to fabricate the reinforcement cages for cast pipe production.



• A view of the tamping-type pipe machine, which produces 24-in. pipe, at the St. Petersburg plant.

After a 15-hr. period the pipe forms are moved to another area, the jackets are stripped, and a curing compound is sprayed onto the fresh concrete surface. After an additional 24 hours the bottom ring pallets are removed and the pipe are transferred to the outdoor storage area for final curing. Two Northwest bridge-type cranes (one 35-ton, the other 10-ton) are used for handling the cast pipe (and Flexicore). The company uses its own spiral winding machine for fabricating the reinforcing cages.

Flexicore slabs are manufactured in two basic sizes—6 5/16 by 12-in. and up to 22 ft. long, with two 4½-in. cores, and 8- by 16-in. up to 26 ft. long, with two 6⅛-in. cores. In preparing the steel forms, the reinforcing steel rods between the bulkheads are prestressed to 16,000 p.s.i. by means of a calibrated torque wrench. After fabricating, the forms are set up on a vibrating table in preparation for pouring. The concrete is delivered in a small rail-mounted buggy; it is charged by the electrically-operated buggy serving the cast-pipe production line. This second buggy is equipped with twin chutes to facilitate pouring. Following screeding, the surface is hand-trowelled, and a curing compound is sprayed on. The forms are stripped after overnight curing, and the units are then transferred to yard storage by means of a Ross 7½-ton fork lift truck. The company uses the old welding beds of the former shipyard for Flexicore storage.

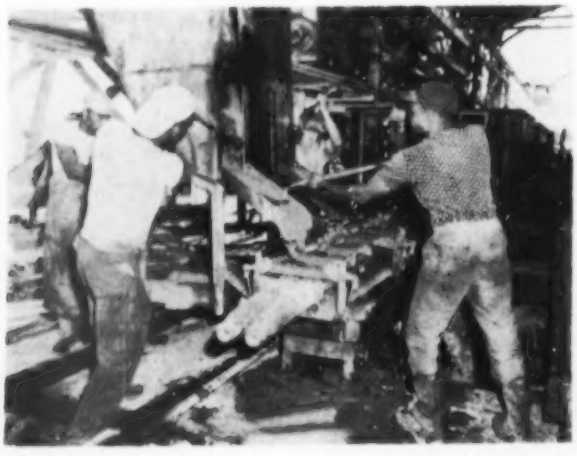
The newer St. Petersburg plant is constructed of concrete block, steel framework, and corrugated steel sheeting. The machine room, housing a Universal 42-cu. ft. paddle-type mixer and a Universal tamping-type pipe machine, measures 40 by 80 ft. and is 30 ft. high. There are four curing rooms, with concrete block walls and a Flexicore roof; each measures 20 by 80 ft. and is 14 ft. high. To streamline flow in and out, the curing rooms are equipped with overhead doors at each end.

As in the Tampa plant, materials are brought in by rail; the aggregates are unloaded by a P&H ⅝-cu. yd. truck crane, while cement, in bag form, is received on pallets and delivered to the mixer by a Ross 3-ton fork lift-truck. Transfer of the mix to the pipe machine is by means of a skip hoist, a supply hopper, a paddle-type pugmill, and a short inclined chute.

The pipe machine produces both plain and reinforced pipe in sizes from 6 to 36 in. in diameter. Compacting is accomplished with mechanical tamping sticks, which vibrate at a frequency of about 960 times per minute and at 850 p.s.i. Simultaneously the form table of the pipe machine revolves at about 36 r.p.m. Finished product is removed to the drying room by means of a hand buggy (for smaller sizes) or a lift-truck (for larger sizes). The pipe are cured by means of a hot water spraying system; provision has also been made for steam curing under adverse weather conditions. After 5 or 6 days in the curing rooms, the pipe are taken to yard storage.

John Harris, a veteran of the pipe industry who has been with Universal for 23 years, is manager of both the Tampa and St. Petersburg plants. Guy Manning and Mitch Fletcher are plant superintendents, respectively, at Tampa and St. Petersburg.

• Pouring a Flexicore slab. Note the twin chutes on the buggy.



• Flexicore slabs are handled by a 7½-ton lift truck and stored on the old welding beds of a former shipyard.

Hydraulic Power and the Industrial Truck Part II

By R. K. GOULD
Technical & Research Division
The Texas Company
New York, N. Y.

IN Part I of this article, which appeared in the May issue of THE CONCRETE MANUFACTURER (page 235), the following topics were covered: principal types of industrial trucks, motive power, hydraulic power for materials handling, advantages of hydraulic power, and the opening sections on hydraulic systems. Part II continues the discussion of hydraulic systems.

Pump The pump is generally regarded as the heart of any hydraulic system because it is the pump which gives the fluid the force required to perform the mechanical work.

Most industrial trucks will use either vane-type or gear-type pumps with capacities ranging from 2 g.p.m. to 70 g.p.m. Usually they will be required to develop pressures up to 1,500 p.s.i., although there are some trucks the hydraulic systems which operate in the neighborhood of 3,000 p.s.i. The pumps may be driven by a direct coupling, gear drive, or occasionally by V-belts.

The gear-type pumps operate on the simple principle that as the gears revolve, oil trapped between the gear teeth and the housing is carried from the suction side to the discharge side.

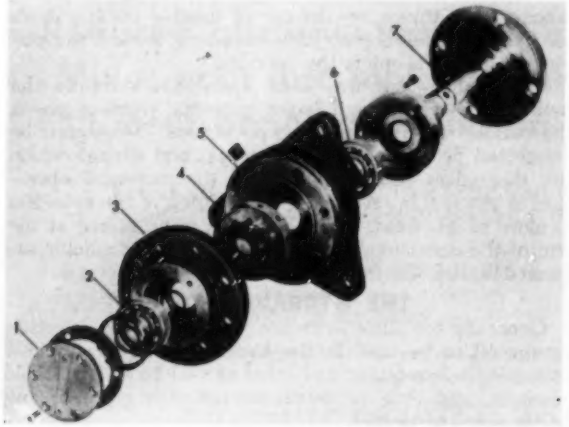
The vane pump consists essentially of a ring in which is located a smaller rotor with radial slots spaced around the circumference. Vanes are fitted in the slots in such a way that they are free to move in and out. As the rotor revolves, the vanes are thrust against the outer ring, forming an effective seal. Pumping is effected by locating the rotor and ring eccentric to each other.

Truck service imposes unusually heavy demands on the hydraulic pump. For example, it is frequently required to operate against relief valve pressures, and the sudden impact resulting therefrom puts a strain in the shaft and in the splines or keys that take the driving force. Also the radial load exerted by a gear or belt drive makes the pump bearings much more critical than in most applications.

Valves The valves might well be regarded as the policemen of a hydraulic system because they direct and control the stream of oil as it travels throughout the hydraulic circuit. They are employed mainly to control (1) the direction of oil flow, (2) the volume of oil going to various parts of the system, and (3) the pressure of the oil at different points within the system. There are many types and varieties of valves available to accomplish these functions, and it is in their choice and selection that the truck manufacturers can exercise practically unlimited freedom and flexibility. Consequently, it would be a herculean task, indeed, to discuss in detail all of the combinations and modifications of valves currently used in the hydraulic systems of industrial trucks. However, they can be classified rather readily in general terms on the basis of the functions they are required to perform.

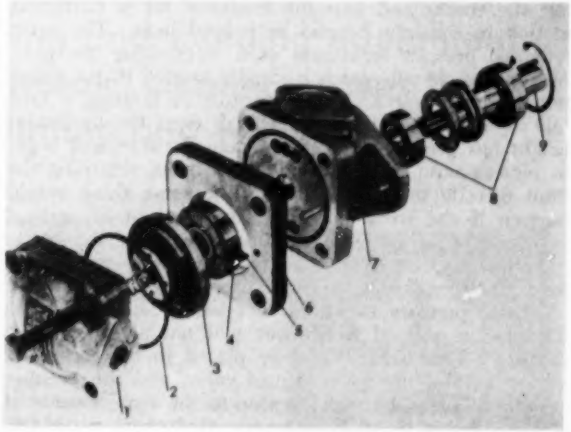
Release Valves Some trucks are equipped to perform only one handling operation, such as raising and lowering a load, and it is here that a simple release valve can be employed. The load is raised by pumping oil from the reservoir to the hoist cylinder, is maintained in the elevated position by means of a check valve, and is lowered by depressing the treadle on the release valve, allowing the fluid to return to the reservoir. The valve is so constructed that the lowering speed can be controlled by the force exerted on the treadle.

Direction Control Valves For trucks capable of performing several independent operations, directing the flow of hydraulic fluid to and from the respective actuating cylinders is somewhat more complicated. In some installations separate valves are used to direct the flow of oil to each function involved. In others a single valve is used to control as many as six different operations. Such a valve usually contains movable spools which control the direction of flow by opening or closing certain ports or passages. These multiple-spool valves can be one of two general types, parallel or series. With a parallel valve two or more functions can be performed simultaneously; for example, a load can be tilted at the same time it is being raised. With a series valve only one operation can be conducted at a time. In most cases pump delivery is constant, and there is no time advantage for parallel operation over

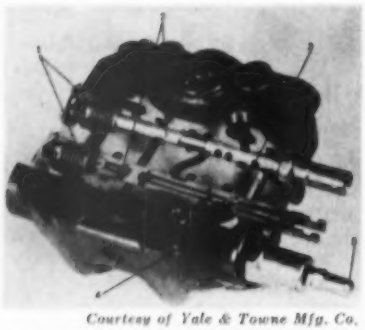


Courtesy Clark Equipment Co.

● Internal gear pump—(1) cover, (2) shaft bearing, (3) pressure plate, (4) rotor, (5) body, (6) shaft bearing, (7) shaft.

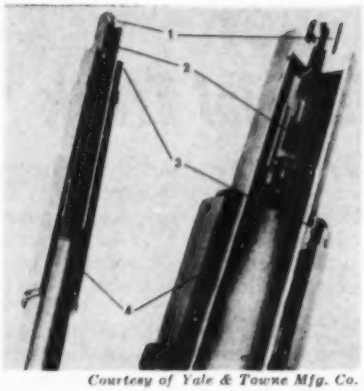


● Vane-type pump—(1) cover, (2) ring seal, (3) pressure plate, (4) rotor vane, (5) rotor, (6) ring, (7) body, (8) shaft bearings, (9) shaft.



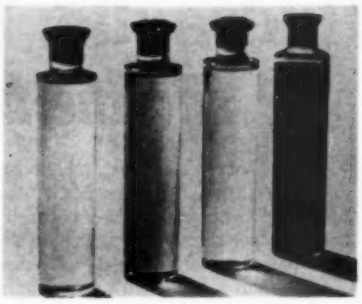
Courtesy of Yale & Towne Mfg. Co.

● Directional control valve—(1) quick-acting springs, (2) hydraulically balanced spools, (3) fine throttling, (4) built-in check valve, (5) built-in adjustable relief valve.



Courtesy of Yale & Towne Mfg. Co.

● Center: Hoist cylinder section—(1) single hose connection, (2) "safety-first" flow regulator, (3) scraper excludes foreign matter, (4) multiple packings.



● New and oxidized oils from A.S.T.M. oxidation test. Left: New inhibited hydraulic oil; left center: same oil after 1,000 hours, Neut. No. 0.1; right center: new turbine grade straight mineral oil; right: same oil after only 100 hours, Neut. No. 2.0.

series, since the same amount of hydraulic fluid must be pumped to complete the motions whether they be carried out simultaneously or consecutively.

Each of the spools in a multifunctional valve will be attached to a lever controlled by the truck operator. When the levers are all in neutral positions, oil is merely pumped from the reservoir through the valve and back to the reservoir. However, when the lift lever, for example, is moved to the hoist position, the respective spool within the valve closes the return of oil to the reservoir and directs it under pressure to the lift cylinder. When the lever is returned to neutral position, the load remains suspended at the height to which it had been raised and cannot be lowered until the lift lever is moved to the proper position. With a parallel valve the operator can move the tilt lever and tilt the load while it is being raised. With a series valve the load can not be tilted until the lift lever is returned to neutral.

Another feature of the multiple-spool valve is that it is usually so constructed that additional spools can be added. If, for example, a particular truck can only lift and tilt and it is desired to add another motion such as rotation, clamp, or push-off, this additional motion can be controlled simply by incorporating another spool in the valve and connecting it to the new cylinder.

Relief Valves These devices can be used to limit pressure in the hydraulic system to a predetermined maximum, thereby avoiding the danger of overloading the trucks and also the tendency for a particular motion to continue beyond its normal limit. The main relief or pressure-regulating valve controlling the pressure in the overall system is usually located in the directional control valve. If an operator in hoisting a load fails to return the lever to neutral when the maximum height has been reached, the system pressure will begin to increase and the relief valve will open, returning the fluid directly to the reservoir. The same thing would happen if the truck operator attempted to lift a load in excess of the rated maximum capacity of the truck.

Frequently, on operations such as clamping delicate loads, a secondary relief valve is provided to limit the clamping pressure to an amount which will enable the load to be grasped firmly but will not allow it to be crushed. This valve is usually placed in the secondary circuit beyond the main control valve, and the pressure can be adjusted by the operator to the requirements of the load being handled. Pilot-operated check valves are also used on clamping devices to assure that clamping pressure will be retained in case the hose connection is broken.

Flow Control Valves Valves of this type are employed to control the speed of lowering a load within safe limits, and it is common practice for this valve to be installed inside the hoist cylinder. If the hose connection to the hoist cylinder should rupture, the load will not drop, but will be lowered at a safe, controlled speed.

Cylinders One of the features of a hydraulic system is that the force generated by the pump and controlled by suitable valves can easily be converted to mechanical motion at the place it is needed. Rotary, linear, or reciprocating angular motion can be obtained by the use of suitable actuating cylinders or fluid motors.

Single- and double-acting cylinders are the types commonly used on industrial trucks, although in telescopic operations the more complicated duplex-type cylinders have to be employed. A simple actuating cylinder consists essentially of an enclosed tubular housing containing a piston and a rod connected to the piston and extending out one end of the head. In a single-acting cylinder, oil pressure is applied to only one side of the piston. An example is a lift cylinder in which the load is raised by forcing oil to the under side of the piston but is lowered simply by the force of gravity. In a double-acting cylinder, oil pressure can be applied to either side of the piston, and the actuated part can be moved in either direction at will. The tilt cylinder on a truck is of this type.

Satisfactory performance of the cylinder depends, among other things, on the use of suitable packing both on the circumference of the piston and around the piston rod where it enters the cylinder.

These, then, are the basic units that compose the hydraulic system as used in the industrial truck to power the various materials-handling operations. They must be connected by suitable tubing, piping, and fittings which are themselves equally as vital to the successful operation of the system. Although the location of the cylinders is more or less fixed, since they have to be placed at the site of the operation, the rest of the units are usually arranged to suit the fancy of the truck manufacturer.

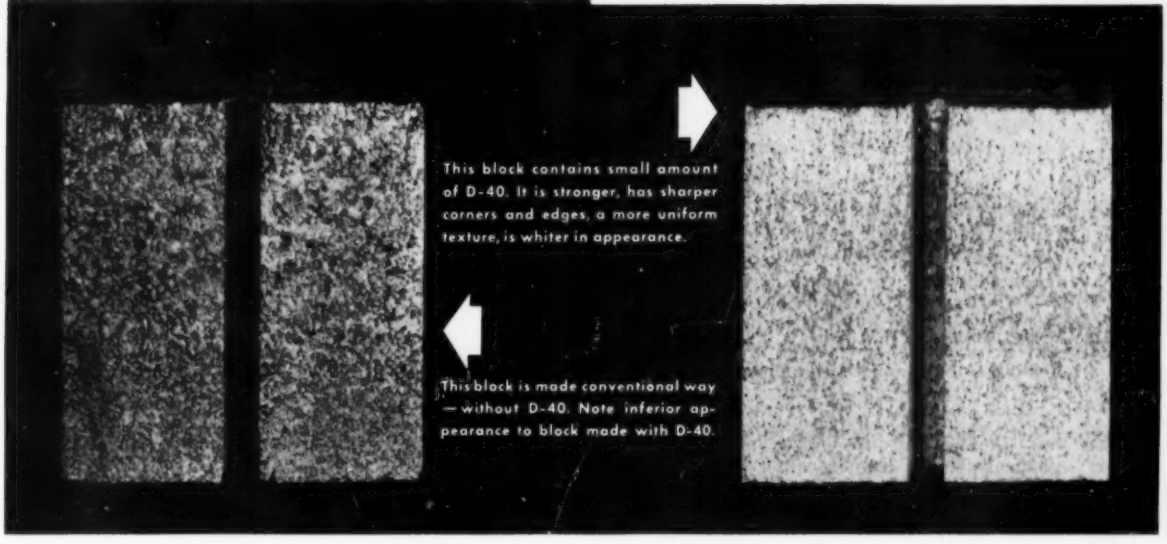
THE HYDRAULIC OIL

Generally too little attention is given to the selection of the oil to be used in the hydraulic system. In most instances it is required only that the oil be of a suitable viscosity, and little or no consideration is given to any of its other properties.

Experience has shown that hydraulic systems, if treated with a reasonable amount of care, will seldom cause trouble. However, when trouble does occur, main-

BETTER concrete blocks at lower operating costs

with low-cost D-40


This block contains small amount of D-40. It is stronger, has sharper corners and edges, a more uniform texture, is whiter in appearance.
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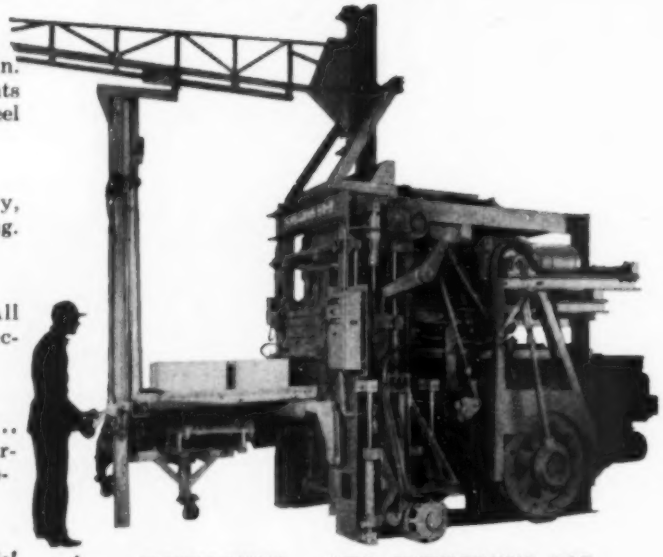

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for EASE AND SPEED OF CLEANING or Making Repairs—*Working Parts All Out in the Open.*

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WE INVITE COMPARISON WITH ANY OTHER 3-AT-A-TIME MACHINE IN THE STEARNS 50-3'S PRICE RANGE!—See Your Stearns Representative, or Write, Wire or Phone Collect for Details and Prices.

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COMPLETE CONCRETE PRODUCT PLANT EQUIPMENT — STANDARD OF THE INDUSTRY

tenance costs can be high. Although the causes of trouble can vary, the results of a recent survey indicate that 70 percent are due to improper condition of the hydraulic oil. What more forceful argument could be found to emphasize the importance of selecting the proper fluid? The petroleum industry, through continual research, has developed premium-grade hydraulic oils, so designed as to have long life, to keep the hydraulic systems clean, and to reduce down time. It is a matter of record that the use of premium-grade hydraulic oils will result in drastic reductions in maintenance costs.

Let's look at a few of the benefits to be obtained by using the premium-grade fluids in the hydraulic systems of the industrial trucks.

Oxidation Stability Perhaps the largest single factor contributing to short oil life and poor operation of the hydraulic system is oxidation of the oil. The ultimate products of oxidation are gum, varnish, and sludge; and their presence to even the slightest degree can be serious and costly. For example, even small amounts of sludge can cause the closely fitted parts in the pump to stick and the orifices in the valves to become plugged. They will also accelerate wear of the moving parts of the pump. Eventually the truck will have to be removed from service, so that the hydraulic system can be completely dismantled and mechanically cleaned, and perhaps costly repairs must be made to the pump and valves.

Many factors can contribute to the oxidation of oils, including temperature, agitation, pressure, and the catalytic effect of metals and contaminants. Practically all of these are present in any hydraulic system, but to an even greater degree in the industrial truck. For example, in materials-handling operations heat is generated when a load is lowered. This heat is transmitted to the oil in the hoist cylinder and is subsequently carried to the reservoir. Because the reservoir is relatively small and the hold-up time short, the heat is not easily dissipated; and the bulk oil temperature runs considerably higher than in most hydraulic installations. It is not uncommon for the oil temperature in the reservoir to average 165 deg. F.; and if the truck has been engaged for a long period in lowering heavy loads, it may be considerably above this. Since temperature is a primary accelerator of oxidation and since the rate of oxidation above 140 deg. F. is rather rapid, conditions in the hydraulic system of an industrial truck are very favorable for oil oxidation.

Premium-grade hydraulic oils contain agents which inhibit oxidation, thereby increasing the life of the oil and keeping the system free from gum, sludge, and varnish.

Rust Prevention Frequently, industrial trucks operate in very moist atmospheres and in such cases a considerable amount of water may accumulate in the system. When water and ferrous metals are in contact, rusting can occur; and hydraulic systems are by no means exempt. Just one or two flakes of rust passing through precision-made pumps and valves can so scratch the surfaces that the efficiency of these parts is impaired.

Most premium-grade hydraulic oils will contain additives that will allay rust formation, and the use of such oils in hydraulic systems can prevent rusting.

Foam Prevention Whenever air and mineral oils are agitated together, conditions are favorable for the formation of foam. Such conditions exist in the reservoir of a hydraulic system, and occasionally such a stable foam is formed that this air-oil emulsion is drawn through the pump and into the system. The deleterious effects of air in promoting pump wear and causing erratic action of the system have been discussed earlier.

Foaming can now be reduced to a negligible amount by certain types of additives which do not necessarily prevent the foam from forming but cause it to break rapidly. Premium-grade oils will usually contain an anti-foam agent.

SUGGESTIONS ON PREVENTIVE MAINTENANCE

Often hydraulic systems of industrial trucks are checked only when the situation demands, due to leakage or failure of the system to operate. In such instances it is usually found that many things should have been attended to long before, in addition to the one which was immediately responsible for the temporary removal of the unit from service.

The hydraulic system is restored to good condition only at the expense of considerable time, labor, and money.

Hydraulic mechanisms are precision units, and their continued smooth operation depends upon proper care. The first step in any maintenance program should be the selection of the proper oil. It must be of suitable viscosity; and to prevent oil oxidation, rust formation and foaming, and associated problems, it should contain rust and oxidation inhibitors and an anti-foam agent.

The selection of the proper oil is an excellent start, but to reduce the chances of trouble due to other causes, regular inspection periods should be established. Specific items to be checked include the following:

(1) Amount of fluid in the reservoir. This is particularly important on the industrial truck, due to the small size of the reservoir.
(2) Both internal and external leakage.
(3) The presence of dirt and other contaminants. In order to obtain the full benefits from premium-grade oils, the system should be kept clean and free from external contamination.
(4) Mechanical damage to any of the components of the system.
(5) Improper adjustments of valves and pumps.
(6) Presence of air.

These are items which can easily be checked, and they should be gone over rather frequently, preferably every week or every two weeks. In addition, it is desirable to make a more thorough examination of the various components of the hydraulic system at longer intervals. The frequency of such inspections should be determined by the type of service to which the truck is put and the conditions under which it has to operate. Normally these inspections should be made after every 1,000 hours of service.

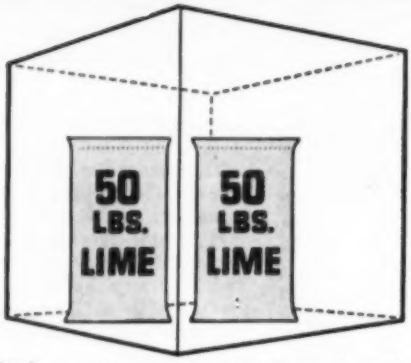
LUBRICATION REQUIREMENTS

This article has dealt only with the hydraulic system of the industrial truck and a discussion of the requirements for a satisfactory fluid to be used therein. Equally important, however, is the selection of proper lubricants and greases for other components of the truck.

Heavy-duty motor oils containing special additives to impart the valuable properties of detergency and dispersion should be employed to assure better compression and combustion. The detergency keeps piston rings free and engine parts clean, and the dispersive ability holds deposit-forming materials in suspension until drained. Such oils are so compounded as to resist oxidation and foaming, to protect alloy bearings, and to prevent scuffing of rings, pistons, and cylinders.

How *FLY ASH* in the Concrete Mix Puts *ALL* the Lime to Work and Makes *FAR* Better Concrete!

Each cubic yard of Regular Portland Cement Concrete contains around 100 lbs. of unused Hydrated Lime



Free Lime in Concrete a Wasted Asset

Although few people seem to realize it, the hydration of cement in concrete-making always produces free lime, sometimes causing efflorescence and other faults. How to convert this lime into a working element has been a problem. But no longer—the answer is found in Fly Ash.

Fly Ash Converts Lime, Strengthens Concrete

Today Fly Ash (largely silica and alumina in fine powder form), used in adequate quantities in the mix, combines with the free lime, converting it to form *added cementing material*. Result: final strength of the concrete exceeds that of straight cement concrete.

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Compressive Strength
Workability, Finish
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Increases Resistance to
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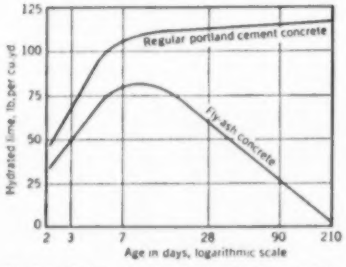
Reduces
Cost of Concreting
Heat of Hydration
Harm from freezing
Harmful Expansion

How Fly Ash Reduces Free Lime



Hydrated lime in 6" x 12" cylinders of job concrete with and without Fly Ash. (Average of 64 tests regular cement concrete at 90 days was 115 lbs. hydrated lime per cu. yd.) (Tests by Consol. Edison Co., N. Y.)

Merits of Fly Ash Proved in Engineering Tests

Many tests by qualified observers prove the lime-converting and strength-building effects of Fly Ash in concrete. Add higher density and better workability, and you have realized priceless improvement. Yet Fly Ash concrete in place actually costs less than straight cement concrete of equal strength.

Write for Information or Technical Help

For information or technical service, write the nearest of the undersigned distributors of *quality-controlled Fly Ash.*

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For gear boxes, chain drives and universal joints, lubricants have been developed to provide greater load-carrying capacity and greater resistance to oxidation and thickening than straight mineral oils. Such lubricants are able to withstand the shock loads experienced in the heaviest drives, thereby prolonging bearing life and reducing wear.

The bearings require a grease providing a tough adhesive film to cushion against shocks and make parts last longer. It must provide ideal film lubrication for ball and roller bearings and at the same time maintain its consistency at the outer edges.

An all-purpose grease for normal operation should have a wide pumpability range and possess good water-repellent characteristics.

The lubricants used on exposed gears are required to cushion load shocks, prevent noise, and reduce wear. They must not channel or throw off, but cling to tooth surfaces and follow through from tooth to tooth despite high pressures, temperatures, and peripheral speeds.

A satisfactory cable lubricant is expected to penetrate and preserve the core, preventing collapse; to seal each wire in a tough viscous film, which reduces internal friction and wear; and to keep out moisture, thus preventing corrosion and increasing the life of the cable.

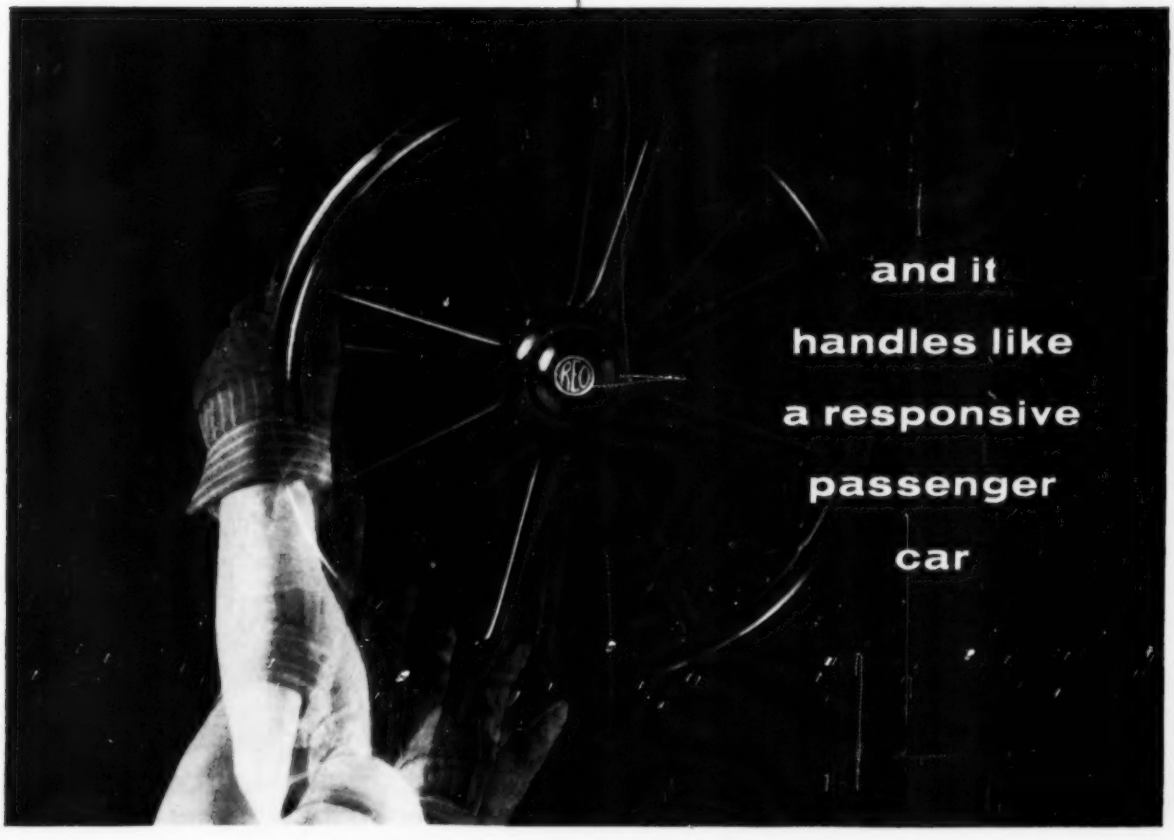
In addition to the use of properly selected lubricants and greases, the importance of good preventive maintenance practices is again stressed. Regularly scheduled lubrication periods, plus a periodic inspection and adjustment schedule, is most essential for trouble-free operation and long truck life.

Mexico (Mo.) Building Products To Double Its Present Output

Lon C. Ware Jr., president of the Mexico Building Products Company, Mexico, Mo., has announced an expansion program for the firm which will nearly double the plant's present output of concrete bolck and ready-mix.

Among the new equipment and improvements scheduled in the $50,000 project are an automatic block machine, new aggregate bins, automatic weigh batchers, an electronic moisture meter for aggregates, conveyor belts, bucket elevators, a boiler, and a high-lift fork-truck. James Elliott is plant superintendent, O. A. McDaniel is secretary-treasurer, and Mrs. Katherine Anderson is bookkeeper.

REO 226-M
with power steering
hauls 6 cu. yds.
per load...
the legal limit...



REO MOTORS, INC., LANSING 20, MICHIGAN

N.R.M.C.A. Survey

(*From page* 175.)

500,000 cu. yd. of ready-mixed concrete last year, accounting for 14.1 percent of the total production. The 50 percent of companies representing the smaller one-half (i.e. below the median) produced about 15 percent of the total yardage. Further, the 8 percent of the companies in the larger brackets produced 45 percent of the total ready-mixed concrete output in 1953.

Table 3 summarizes returns on other phases of the inquiry. The statistics compiled in this table include only the 891 companies actually returning the questionnaire and do not cover the additional 122 companies whose statistics were otherwise available. The total number of truck mixers or agitators operated by the 891 companies was 12,705, representing an average of about 14 units per company. Proportioning plants were reported by 635 companies, which have 1,082 such plants in operation, at an average per company of 1.7. Central mixing plants were reported by 329 companies, which have 431 such plants in operation, at an average per company of 1.3. The average number of mixers or agitators per plant reported was 8.4. The participating companies reported 1,604 non-agitating units in operation, at an average of 1.8 per company.

Pres. Rinker Announces List Of N.C.M.A. Committee Heads

According to M. E. Rinker, president of the National Concrete Masonry Association, members will soon receive their 1954 membership roster, which will list the personnel of the various working committees. Mr. Rinker has released the following list of committee chairmen:

Executive committee, M. E. Rinker; past presidents' committee, Sam Paturzo; executive office committee, M. E. Rinker; budget and finance committee, A. R. Waters; promotion committee, Otto Buehner; technical problems committee, Benjamin Wilk; local state and regional committee, Philip Paolella; convention and exposition committee, Jay C. Ehle; membership committee, W. R. Ireland; trade relations committee, H. W. Bush; rules and bylaws committee, John L. Strandberg; accounting procedures committee, Glenn C. Barnes; accident prevention committee, Earl Peterson; and employees retirement committee, Henry E. Buchholz.

Jones COMPRESSION TESTING MACHINE

for more economical mixes, and uniformly higher strength

By doing your own testing of concrete blocks and cylinders, you will immediately discover anything which may have gone wrong with the aggregate, grading, mixing, etc. This will help you maintain more uniform quality and develop more economical mixes. The Jones (formerly Yoder) testing machine is low in first cost, specially designed for concrete products plants.

Send for list of satisfied users and literature.

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Servicised form oil concentrate

★ Reduces Form Oiling Costs
★ Easier to handle...less bulk... less storage space...less waste
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Servicised Form Oil Concentrate provides greatest economy and flexibility in use because it can be diluted with up to 24 parts of water without losing its adhering or protective qualities. Labor and haulage costs are minimized because sufficient quantities of form oil can be made up on the job as needed. The concentrate is harmless to skin and clothing . . . non-inflammable and resistant to freezing.

Available in 5 gallon cans and 53 gallon drums.

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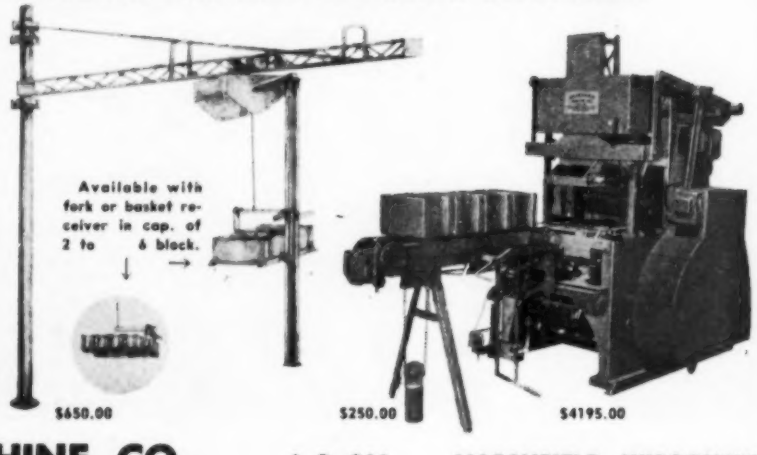
AUTOMATIC 400—4 BLOCK RECEIVER—ELECTRIC OFFBEARER

- Automatic cycle with 300 to 400 block/hr. cap.
- Various style block all on one cored pallet
- One man operation
- Minimum of moving parts
- Swinging Receiver for hand offbearing
- Automatic Receiver accumulates 4 block for power offbearing
- Electric offbearer, variable speed, instantly reversible
- Simple electric drive with built-in clutch & speed control (mechanical) (patent in process)



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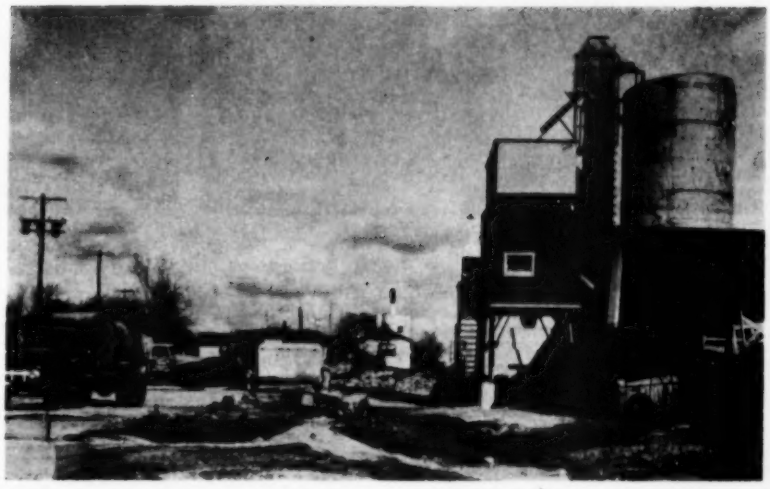
Compact Concrete Operation Planned for Efficiency, Economy

OPERATORS of ready-mix or transit-mix plants, or any person considering entering a related field, would do well to visit the plant of Concrete Inc. in Rogers, Ark. This community centers about

By JOHN VAN WAY

a city of 6,000 (Chamber of Commerce figures) in one of the largest food-producing areas in the nation. Since Rogers is practically equidistant from Bentonville (west) and Springdale (south), the transit-mix business potentiality was unknown to the owners. Hence, an operation small enough to keep the original investment down, yet large enough to meet local business requirements had to be considered in the design and construction of the plant.

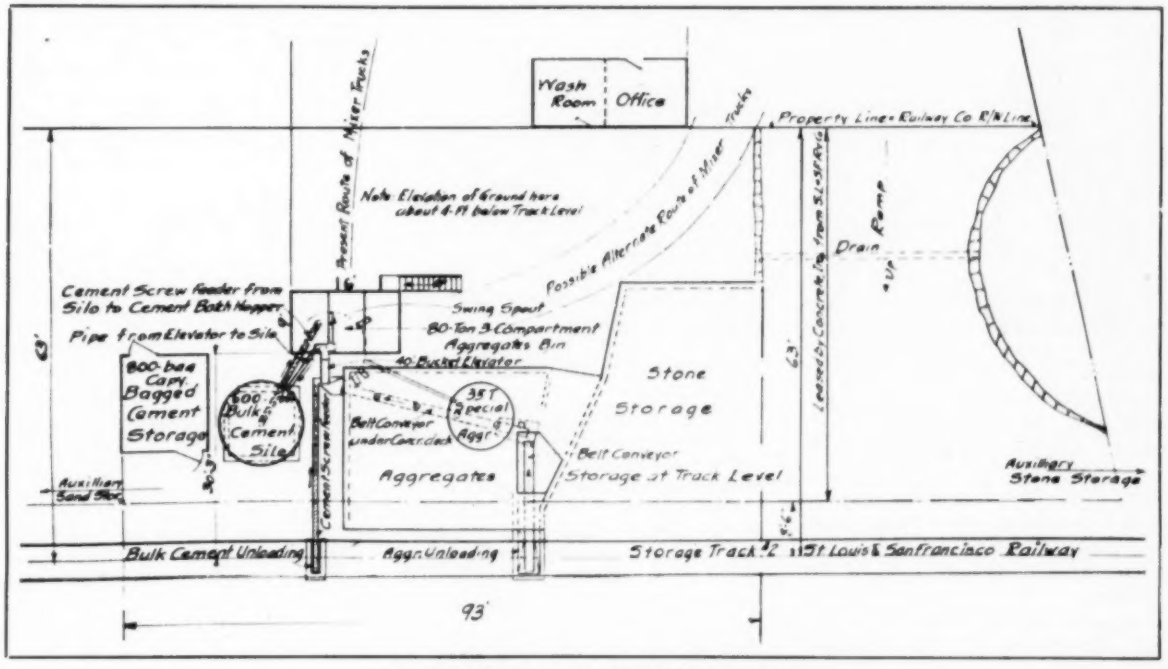
At Concrete Inc. the owners have installed some of the latest and best features of much larger plants; they have improved on some of the current accepted materials-handling de-



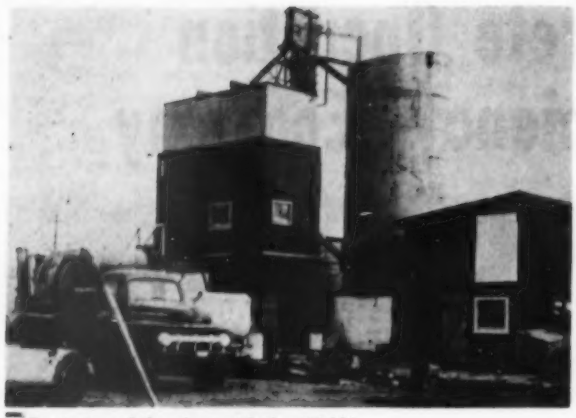
● A general view of the plant of Concrete Inc. at Rogers, Ark., with two of the three transit-mix trucks.

vices; and they have worked out some unusual ideas of their own. The following are some of the features and characteristics which have contributed to the success of the venture: low initial investment; one-stop, two-man, economical, and efficient operation; limited overhead storage, but ample ground storage, with fast, efficient, economical reclamation facilities; provision for changeover from use of bag cement to bulk cement without costly changes or down time; limited initial capacity, with provision for expansion; drive-through or back-up charging; limited plant site requirements; and special "extra-curricular" sources of income.

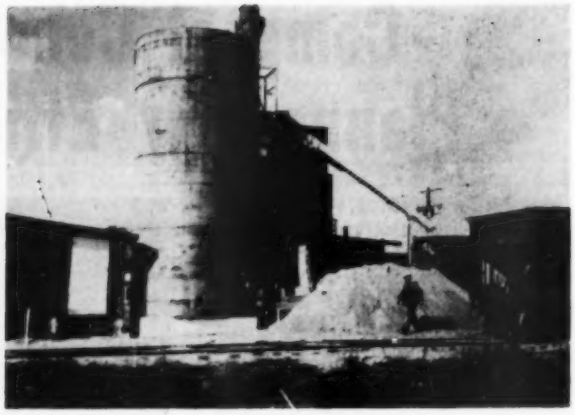
The compact modern plant of Concrete Inc., includes an 80-ton



● This sketch of the plant layout demonstrates why Concrete Inc., covering only about 3,720 sq. ft., can operate both efficiently and economically.



● Front view of the plant, with the 600-bbl. bulk cement storage silo at the right and the main building housing the overhead three-compartment bin and weigh-batchers and topped by the enclosed belt-bucket elevator. At the extreme right is the bag cement storage building.



● Track-side view, showing the stone and sand storage, the cement silo, and the bag cement building.

heaped-capacity three-compartment Hummel bin, a 2½-cu. yd. C. S. Johnson weigh-batcher with a 3-beam scale, a 40-ft. enclosed belt-bucket elevator, two Baughman aggregate conveyors, two screw feeders, an 800-bag capacity storage house, a 600-bbl. Hummel bulk cement storage silo, and a 1,500-lb. capacity Winslow bulk cement weigh batcher. All of this cost less than $20,000, erected.

This low initial investment was possible because the plant was designed by specialists in plant arrangement and layout. New equipment was purchased from several leading manufacturers of materials-handling equipment, and all equipment was co-ordinated into a modern efficient plant with the minimum of erection costs. (For example, the concrete plant uses the same bucket elevator efficient for handling of sand, stone, and bulk cement. The savings in the cost of a separate bulk cement elevator alone is considerable.)

All concrete materials are weighed and placed in transit-mixers without changing mixer location, and yet the bulk cement is weighed on a separate scale. A collecting hopper designed with low head room in mind guides the water, sand, stone, and bulk cement into the transit mixers quickly and efficiently.

Concrete Inc. has poured as much as 130 cu. yd. of certified concrete with three mixers on a 17-mile round trip haul using only two men at the plant. One man took care of the batching, writing delivery tickets, and answering the telephone, while the other man kept the bin full either from the stock piles or from hopper-bottom railroad cars.

Concrete Inc. has loaded and dispatched a 3½-cu. yd. load of concrete within 5 minutes, which is fast considering the fact that the weigh-batcher is a 2½-cu. yd. unit and that every load of specified concrete is visually checked for consistency of mix. The average daily capacity of the plant in the first year's operation was approximately 30 cu. yd., but on many occasions more than 100 cu. yd. has been poured without any increase in plant labor.

The maximum heaped capacity of the three-compartment overhead storage bin is 80 tons, enough for approximately 35 cu. yd. of certified concrete. Since pouring 100 cu. yd. of concrete in a day means that the bin is emptied roughly three times, reclamation from the ground storage stockpiles must be fast and efficient. The plant also has 100 tons of live sand storage and 60 tons of live stone storage, with additional supplies of both available with a small front-end loader. Ground storage stockpiles can be replenished during slack time, eliminating the need of extra labor and expensive rehandling.

Originally a hopper holding 10 bags of cement was used. The feed end of a 20-ft. screw conveyor was located beneath it, for conveying the cement to the collecting hopper under the aggregate weigh-batcher. This same screw conveyor was later installed under the cone of the bulk cement silo for conveying the bulk cement to the new separate cement weigh-batcher.

Although the plant was planned for an average daily capacity of 40 to 50 cu. yd., the design provided for facilities to pour up to 200 yards per day if the demand for concrete increased to that amount. At Concrete Inc. increased daily capacity demands are taken in stride by merely adding additional transit mixers to the fleet. Thus costs are kept down.

The feature of providing for either backing under or driving under the bin in charging the transit-mixers may seem irrelevant, but this arrangement could be important in many cases. For instance, a change in size or type of mixer may mean that there is not enough room to back under the bin. This could entail costly changes.

Emergency batching problems were solved by arranging the bin so that trucks can be driven under it to get the water and aggregates. The driver then proceeds to the bag cement house, where the cement can be dumped into the transit-mixer by hand. Moreover, by taking advantage of a 4-ft. grade difference, the operators have been able to batch the mixers by means of the front-end loader. This unit is used only when the material bin is empty. The entire plant layout is only 93 ft. by 39½ ft. in area. (See plan of facilities.) The Service Equipment Company planned and erected the plant.

Naturally, the most important consideration was to make money for the owners; and with the first year of operation over, this appears assured. As most operators of small plants know, there should be some side line to help keep the overhead down in slack periods. Transit-mix concrete is the company's principal business; but other ventures also are bringing in good returns. Circular and rectangular stepping stones are made of returned concrete in forms of tin and hinged two-by-fours. Septic tanks have been turned out in 48-in. concrete pipe forms. Materials have been unloaded for other firms that do not have hopper-bottom car-unloading facilities.

One of the most unusual services performed by Concrete Inc. (for a slight charge, of course) was wetting down truckloads of ensilage for a custom silage contractor. With the company's 1,000-gal. water surge tank and a 200-gal. water weigh-batcher having 4-in. openings, it was possible to wet a truckload of ensilage in a matter of seconds, a task which with other equipment would have required 10 minutes.

P.C.A. Analysis Shows New Safety Records Set By Cement Manufacturers

A whole group of new cement industry safety records were set in 1953, according to Ivan F. LeGore, safety director of the Portland Cement Association in Chicago. Analysis of 1953 accident figures shows that member companies of the P.C.A. reported the largest number of accident-free plants for the 38 years during which safety records have been kept for the cement industry. The accident frequency and injury severity rates among association members were the lowest in the history of cement safety work.

The Portland Cement Association awards a safety trophy to member company plants operating a full calendar year without a lost-time accident. Of the 55 accident-free plants in 1953 (seven more than last year) 51 qualified for re-award of trophies won previously, one won a trophy for the first time, and three rated honorable mention. Prior to 1953 the highest number of accident-free plants was 54 in 1933 and 51 in 1948. A single disability in each of 26 plants spoiled their trophy chances for 1953.

Ten portland cement plants operated without any chargeable injuries throughout the three-year period, 1951-1953.

The new all-time low-frequency rate of 3.81 accidents per 1,000,000 man-hours worked in 1953 was 18 percent below that of 1952 and 10 percent lower than the previous record rate of 4.22 set in 1951. The new record injury severity rate of 1.67 days lost and charged per 1,000 man-hours was 27 percent below the 1952 rate and 7 percent lower than the previous lowest rate, set in 1932.

Of 131 mining and quarrying operations, 100 were accident-free in 1953, compared with 95 perfectly safe in 1952. There were 78 with perfect records in both years. Quarrymen contributed markedly to safety progress by reducing their injury frequency and severity rates 40 percent.

18 large producers in one state alone use

Hi-Lo
CONCRETE TRANSPORT MIXER CO.

This demand is based upon profit-making experience!

In Florida, a state noted for volume production of ready-mixed concrete, 18 of the largest producers use Hi-Lo stationary drum truck mixers. They've found that Hi-Lo produces more profit than many other makes, yet sells for several hundred dollars *less!* You get it for less because Hi-Lo is sold *direct to you.* The customary percentage usually given to distributors stays in your pocket in in the form of savings. This rugged, dependable mixer is constructed to operate for years with only routine maintenance. Your customers will like Hi-Lo's exclusive feature: Visible Mixing Action. You can *see* the mix, make sure it's exactly right every time. Try Hi-Lo. It will take only a few trips to see why it's won such acceptance—in Florida and throughout the world!

THESE FEATURES MAKE THE DIFFERENCE!

POWER TAKE-OFF DRIVE — save money on cost of separate engine, gas, maintenance.

REPLACEABLE LINERS, of abrasive-resistant steel. You never have to replace the drum!

FULL 180° RADIUS DEEP-CUT SWING CHUTE, for fast discharge.

SLIDING GATE for accurate control. No seal to replace!

NON-LEAKING, SELF-TIGHTENING PACKING GLANDS, last for years.

3—MIXED
4—AGITATOR

DEMAND THE BADGE OF DEPENDABILITY

MAIL TODAY for complete prices, terms, descriptive literature

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Please rush full information, prices and terms on the following:
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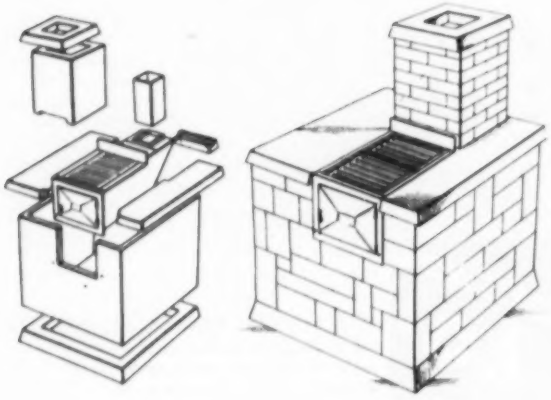
City_____ State_____

CM New Machinery and Supplies

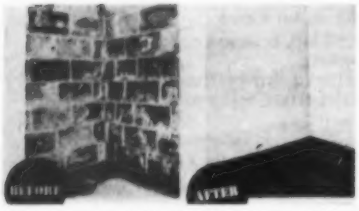


● Capitalize on the outdoor living trend. Sectionalized fireplaces, made on Homeward forms, fit together (no bolts) and can be knocked down for storage. The easy to pour, easy to strip forms give a stone design to the body and a brick pattern to the chimney. Fireboxes are rust-resistant aluminized steel. Roger F. Williams Co.

CIRCLE 101

● Materials "move out" of hopper bottom cars with this National car shaker. It uses a 5-hp, 1750-rpm Reliance a-c motor to meet the high rate of vibration and peak operating loads. Mounted on a jib crane, the push-button unloader serves where two men formerly did the hazardous inside job unloading the car.

CIRCLE 102

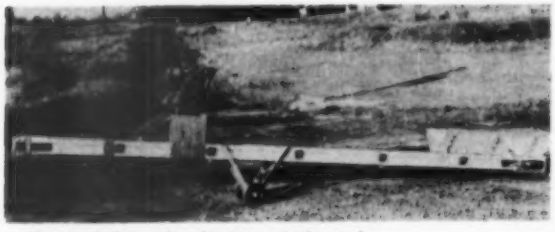


● An improved formulation of an oil-base masonry paint seals concrete surfaces with a flexible film and resists fungicidal agents, Ohio Paint & Color Co. says. Applied direct from the can, Cindrseal has an extremely fine grit that "fills in" pores, cracks, etc. A wide color range is available. Sell it to your concrete customers.

CIRCLE 103

● Lined up for inspection! This is only a part of the fleet of trucks operated by Consolidated Rock Products, Los Angeles. Representing many makes, these all carry on their hoods the Gold Comet insignia of Reo Motors, signifying a high popularity for Reo's 6-cylinder gasoline engines. The new Reo 331-cu. in., 160-hp Super Gold Comet has been installed in over 100 Consolidated vehicles. Reo OH-160 engines have replaced 50 engines of over 500-cu. in. displacement. Other Reos have replaced 42 V-eight engines and several diesels.

CIRCLE 104



● Sturdy lightweight aluminum rivals steel in this new Farnco conveyor for handling concrete, soggy sand, etc. Flashing the entire length of the belt with rubber licks the leakage of materials problem. The deep hopper centers the material on the 16-in. belt. Gasoline, air or electric power is available.

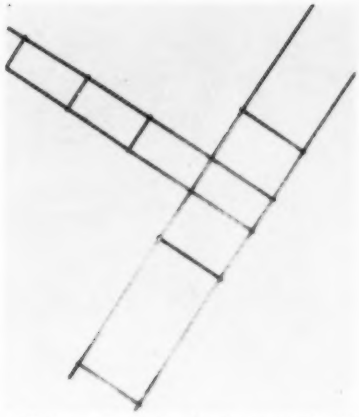
CIRCLE 105

● EXTRA DOLLARS FOR YOU. Offer your customers the Fleetite line of double-hung windows. Frame, interior and exterior sash and half-screen are combined in an easy to install package. Made of lightweight aluminum, they provide both the modern design and the insulation factor needed for today's air-conditioned, concrete homes.

CIRCLE 107

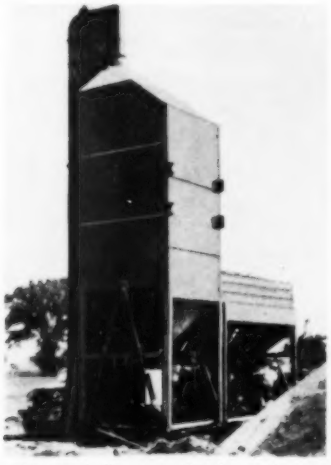
● Cubed block unloads to either side or behind the truck with this Side-O-Matic unloader, developed by York Stone & Supply Co. Adaptable to any truck or trailer, it will unload six 72-block cubes at different spots around the jobsite in 15 minutes, and can pile them two high or place them into the excavation, as desired. Electric motors, powered from the truck engine, control operations.

CIRCLE 106

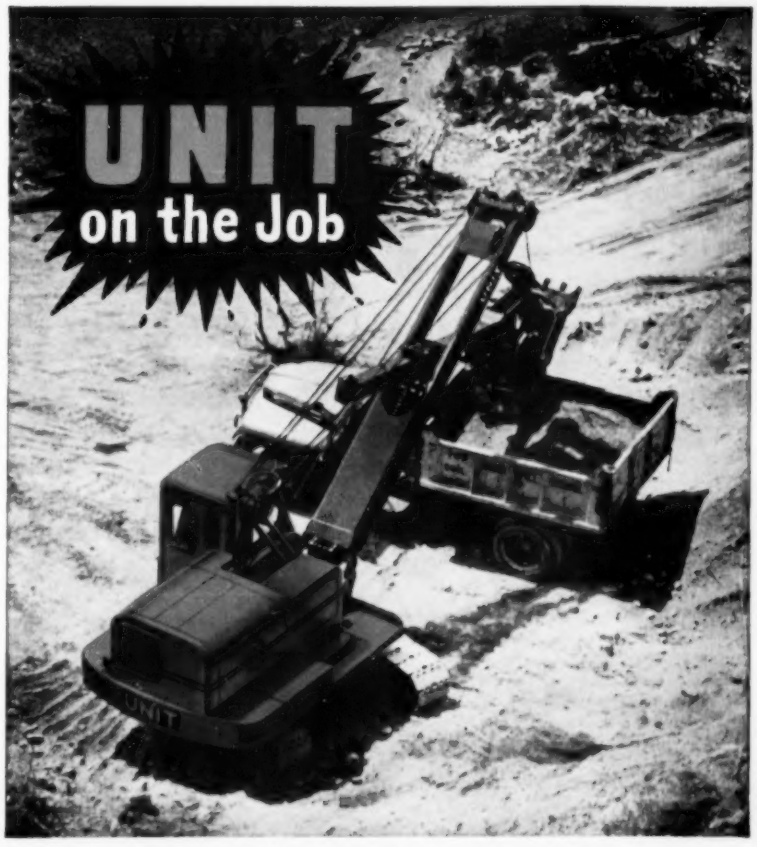


● Better wall construction is promised with this AA Wire Products Partition-Lok. It eliminates the need for anchor bolts, provides continuous reinforcement, keeps cavities unobstructed, gives constant joint thickness, and provides an excellent tie-in with the lower wall, AA says. The partition tongue extends 24-in. beyond the inside of the exterior wall. Flush welded; 16-in. returns; cross bars on 8-in. centers.
CIRCLE 108

● Controlled curing to keep the water in the concrete mix until full strength is developed. Servicized membrane-forming compound is furnished as white pigmented, clear or separation varieties. It can be brushed or sprayed as desired, and will "stay put" on vertical surfaces.
CIRCLE 109



● This new bulk cement bin for trolley operation has been announced by Construction Machinery Co. Bins are 8x8-ft. in size, with 25, 150, 200 or 300 bbl. capacity.
CIRCLE 110



SWING SPEED makes PAY LOADS!

Here's a UNIT ½ Yard Shovel doing a PRODUCTION DIGGING JOB in a gravel pit. UNIT owners like the ease of operation and the FULL VISION CAB for complete visibility. They also like the sturdy construction and the many mechanical features, plus the ECONOMICAL PERFORMANCE and LOW UP-KEEP which all add up to EARNING POWER. Why not investigate what UNIT can do for you — on YOUR next excavating and material handling job?

SEE FOR YOURSELF: *Let us send you our novel TV Brochure. It illustrates the complete UNIT line.*

UNIT CRANE & SHOVEL CORPORATION
6329 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

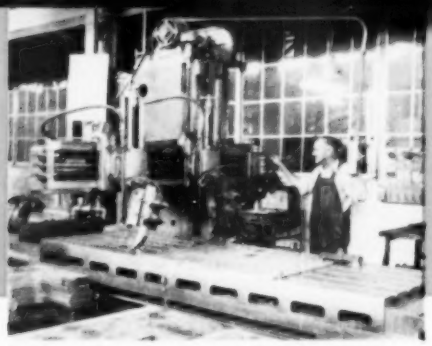
½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

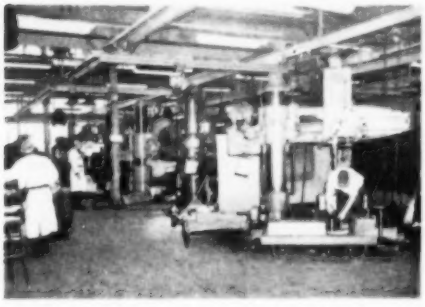
Yes Sir BESSER VIBRAPACS *Do Excel*

. . . and here's why:

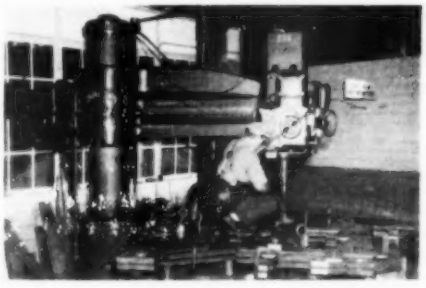
VIBRAPACS excel because they are made in a spacious modern plant, by skilled craftsmen using the finest precision machine tools available. Every VIBRAPAC is backed by 50 years of engineering and production know-how. Hundreds of Besser trained mechanics and "career men" have devoted their lives to building Besser equipment. Sons have followed their fathers into this block machine business. In a few instances, the third generation is represented. They work in a well-equipped plant that has every modern production facility. On these pages, we show only a few of the precision machine tools that enable Besser to make better block machines.



Rockford hydraulic horizontal planer that does the rough and finish planing of massive parts.



Battery of Carlton 4' and 5' Radial Drills for jig drilling and tapping of parts requiring close tolerance.

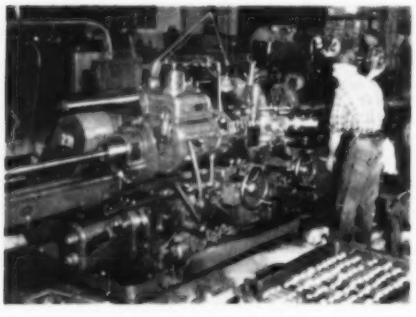


Carlton 6' Radial Drill that does precision drilling and boring on all Besser side plates.

(Left) Cincinnati Hydrotel Profiling Machines accurately form-mill Besser stripper shoes, core plates, sprockets and other precision parts.

(Below) Warner & Swasey Turret Lathe, producing precision notched pins.

Close-up of Cincinnati Hydrotel machine, form-milling stripper shoes.



Bliss 1500-ton press for blanking and forming cores.

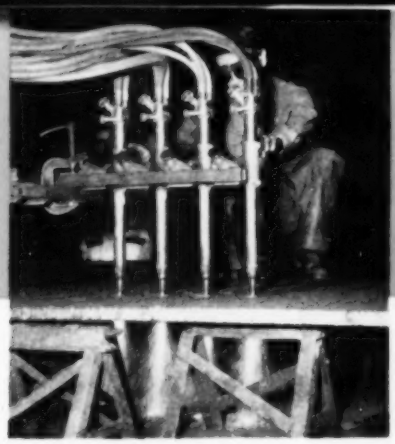
VIBRAPAC'S *Automatic* **"KNOW HOW"**

produces better Concrete Block, faster, at less cost.

BESSER
50th Anniversary
1904-1954

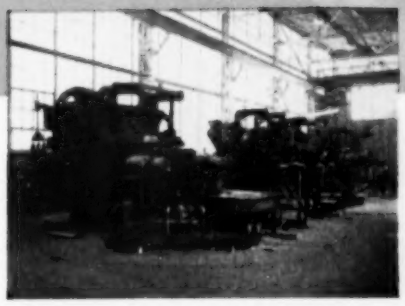
. . . a Half Century of Concrete Masonry Progress

BEST PRODUCTION FACILITIES MAKE BESSER CONCRETE BLOCK MACHINES BEST

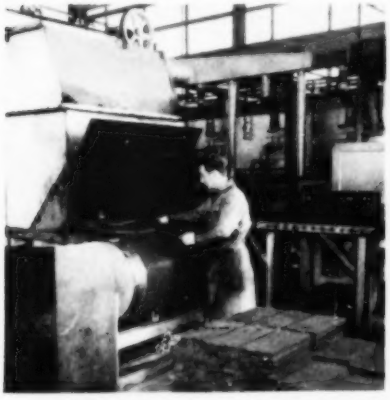


Modern welding and cutting equipment speeds precision production . . . this Oxwell shape-burner, for instance, works on four parts simultaneously cutting automatically and accurately to templet.

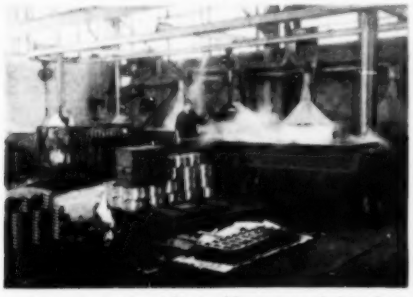
This continuous carburizing and hardening furnace is a vitally important aid to quality and long wear without distortion.



In final stages of assembly, every VIBRAPAC part must fit perfectly and perform efficiently.



Modern continuous tempering furnace adds long wear to Besser parts.



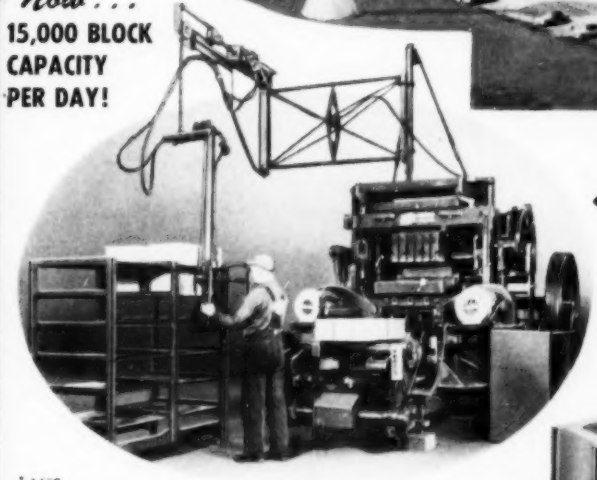
Besser parts are thoroughly rust-proofed in these Parkerizing tanks.

. . . and remember
GENUINE BESSER PARTS always help you keep VIBRAPACS operating like new!

RUGGED and DEPENDABLE!

No BESSER VIBRAPAC has ever worn out.

Now . . .
15,000 BLOCK CAPACITY PER DAY!



FROM THIS PLANT COME THE VIBRAPACS
FROM THE VIBRAPACS COME THE BLOCK
FROM THE BLOCK come the world's finest structures of all types and sizes . . . with economy!

2,000,000,000 UNITS PER YEAR IN THE INDUSTRY

Business is good for BESSER-equipped Concrete BLOCK PLANTS!

J 3487

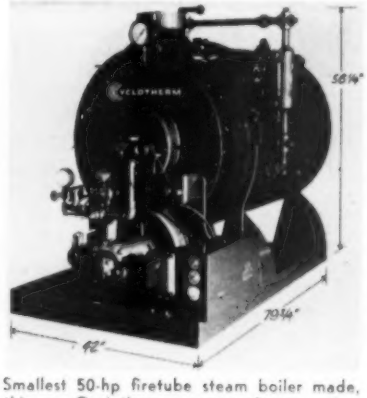
BESSER MANUFACTURING COMPANY • Alpena, Michigan, U.S.A.

● Unloading a lift a minute, this Hydro-Lift developed by G&H Machine Co., is under complete control at all times, using positive hydraulic power from the engine power take-off. It weighs less than 1500 lbs., and will pay for itself in six months, G&H says.

CIRCLE 111

Rectangular septic tanks are made with these rugged, reinforced, all-steel Norwalk Vault Co. molds. Available for the 300 and 1200 gal. tank capacities, the molds come in two styles—a one piece and a two piece model with venting and cleaning facilitated by large vents and removable inspection covers built into the top of the tank, and with baffles or tee tiles.

CIRCLE 112



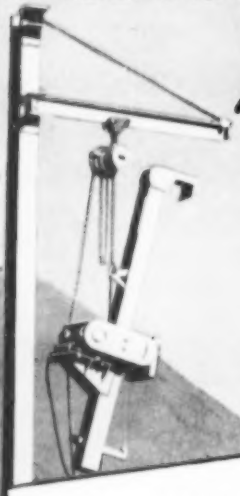
Smallest 50-hp firetube steam boiler made, this new Cyclotherm power package requires less than half the floor space (about 20 sq. ft.) and about two feet less headroom than any other steam generator of equal hp.

CIRCLE 113

A big working surface free of seams and an elastic jersey knit lining for dexterity feature this new Stanflex glove from Pioneer Rubber Co. The plastic coating resists abrasion, oils, acids, etc., and keep the wearer's hands dry. The knit lining provides a comfortable surface next to the hand. Several styles are available.

CIRCLE 114

Faster Unloading with the *National Car Shaker*



FASTER, SAFER, LOWER-COST UNLOADING with the *low cost* National Car Shaker. Unloads a car in as little as six minutes with no man required in or under the car, under normal conditions. Unloads coal, coke, cinders, sand, stone, aggregates and all bulk materials.

Used and time-tested by hundreds of firms, both large and small. The time saved by Consumers Company, (see letter below) is typical.

Consumers Company

79 WEST MONROE STREET Chicago 3, Illinois

BUILDING MATERIALS - READY MIXED CONCRETE SAND GRAVEL CRUSHED STONE

July 8, 1953

National Conveyor & Supply Co.,
350 North Harding Avenue,
Chicago, Illinois.

Gentlemen:

I am taking this means of expressing our pleasure in the efficiency of your car shaker. We have four National Car Shakers at our various yards and all are being used to unload sand from hopper cars.

The sand is received containing various amounts of moisture and prior to the use of your car shaker the sand was pushed down by hand, thus not only adding to the expense of unloading cars but also curtailing the amount of sand we were able to unload to a point below that which was required in our operations. We now unload even wet sand with sufficient speed to keep our plants running.

The shakers have been comparatively trouble free and on the few occasions when they needed service we found your company very cooperative in expediting the repairs.

Yours very truly,
CONSUMERS COMPANY
Robert J. Hummel,
Vice President.

RJH:lk

PATENTED

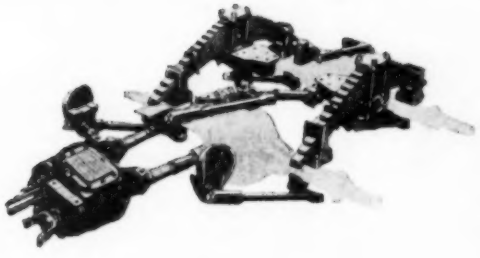
WRITE TODAY for information on how the National Car Shaker can save money, time and labor for you.

National Conveyor & Supply Company

348 N. HARDING AVENUE CHICAGO 24, ILLINOIS

NOW ..TWO GREAT TRUCKSTELL SIX-WHEELERS!

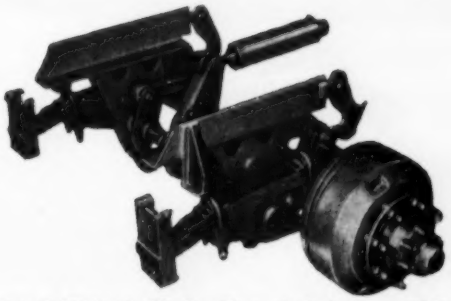
Which one will earn you the most profit?



Truckstell-Baumis Dual-Axle Drives—with exclusive rear axle kickout—supply *positive* dual-drive traction off the road, *positive* single-axle economy on the highway.

Dual- or single-axle drive selection can be made at any road speed, instantly, without slowdown, gear clash, or declutching. And Truckstell's *built-in* 3-speed auxiliary provides a puller gear for power when required, a gear splitter for faster trips, improved engine performance and economy.

If you need *maximum* floatation and traction to move big loads, Truckstell Dual-Axle Drives are made for you. They'll double payloads and performance on your medium and light-heavy trucks . . . using 2 *standard* matching driving axles for long life and extra capacity. Get full information today.



Truckstell-Willock Hydro-Trac 3rd Axles—with exclusive cab-controlled traction—give you the payload advantages of 50-50 axle load distribution, the economy of a single-axle truck, the highway traction of a dual-axle drive . . . all in one low-cost, easy-to-operate unit!

Hydro-Trac is unequaled for hauls made mainly on hard roads even though slippery with mud, ice or snow. When extra traction is needed, it instantly can transfer more than half its trailing axle's load to the driving axle! In addition, its trailing axle can lift clear of the road for fast, economical return trips when truck is empty.

If you want *extra* payload, traction and economy on trailing axle hauls, Hydro-Trac is your most profitable answer. Models and trailing axles are engineered for all makes of trucks. Send for complete details today.

Truckstell

MANUFACTURING COMPANY

Union Commerce Building • Cleveland 14, Ohio

Makers of famous Truckstell Dual-Axle Drives, Hydro-Trac 3rd Axles, auxiliaries and other types of special truck equipment.

Truckstell Manufacturing Company
Dept. DH-4, Union Commerce Building, Cleveland 14, Ohio

Please send me complete information about Truckstell

☐ Dual-Axle Drives ☐ Hydro-Trac 3rd Axles

NAME _____

ADDRESS _____

MAKE OF TRUCK(S) _____

New Literature

PRECAST, PRESTRESSED concrete slabs for floors and roofs, made with long-span *Flexicore*, are explained and described with many drawings in this brochure.
CIRCLE 115

BELT REPAIR GUIDE. How to splice and repair conveyor and elevator belting is told in detail in this 32-page manual from *B. F. Goodrich*.
CIRCLE 116

CAPITAL FORMS. Several advantages are listed for *Denform* capital forms, used together with Sonotubes in casting modern concrete columns and pillars. The reusable capital form cuts handling costs and reduces the amount of concrete finishing.
CIRCLE 117

HANDLING SILO STAVES. A field report on how one concrete manufacturer improved his handling operations and eliminated errors in truck loading is contained in this *Rapistan* bulletin.
CIRCLE 118

INSTANT STEAM! Within five minutes from a cold start, the *Clayton* steam generator will provide quality steam at full working pressure, this brochure says, describing the forced recirculation principle that produces more horsepower per pound of weight and dollar of fuel cost while taking up much less room than conventional methods.
CIRCLE 119

KILN DOOR CONTROLS. Electric eye doors are among the several types of industrial doors described in this *Electric Doorman* bulletin-catalog.
CIRCLE 120

SAFETY TREADS and thresholds for use in concrete construction are shown in this *Wooster* catalog. Aluminum, brass, steel and various abrasive treads are shown.
CIRCLE 121

CONCRETE COLORS. Instructions for mixing *Lansco* dry colors for concrete block, poured concrete surfaces, etc. are given in this color card, which contains sample chips showing colors produced by various mixes.
CIRCLE 122

AIR METER. A new Protex air meter, developed by *Autolene* to measure entrained air, gives better, faster results, this bulletin says.
CIRCLE 123

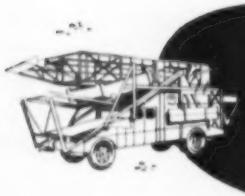
LIFT TRUCK MANUAL. The fifth edition of the *Hyster* booklet, "How to Operate a Lift Truck" has just been published and is available without charge to truck operators, supervisors, safety engineers and others interested. It is filled with information on operation, preventive maintenance, safety and basic materials handling, interesting to both the beginner and the experienced operator alike.
CIRCLE 124

MEASURE ENTRAINED AIR. No special training is needed and no computations have to be made in measuring entrained air in concrete with the *Roll-A-Meter*, a precision instrument of solid bronze that weighs 22 lb. overall. You needn't know anything about the weight or physical characteristics of the ingredients supposed to be in the mix.
CIRCLE 125

BLOCK UNLOADER. A four-cube concrete block truck unloader recently introduced by *Arthur Rehberger* is described in this bulletin. Featuring a tilting flatbed, it operates mechanically and keeps the load under positive control. Other models will handle up to 12 cube.
CIRCLE 126

2 yard MIXERMOBILE

ONE MAN AND THE 2-YARD MIXERMOBILE CAN MIX AND ELEVATE 50 CU. YDS. PER HOUR—set-up time, approximately 10 minutes. Electronic water meter—improved batch timer and counter—all hydraulic controls—highway speeds to 20 m.p.h. Call or write for complete information.



MIXERMOBILE DISTRIBUTORS, INC.
8027 N. E. KILLINGSWORTH STREET
P.O. BOX 7527 • PORTLAND 20, ORE.

• Scoopmobiles • Duo-Way Scoops and Lifts • Stationary Mixers
• 4-Wheel Drive Scoopmobiles, Dozermobiles, Tractors • Mixermobiles

N.C.M.A. Pushes Program Of Promotional Features By Press, Mail, Radio, TV

N.C.M.A.'s promotional program is in full swing, as witness the advertisements which have appeared in several construction and architectural publications. Reprints of these advertisements have been sent to members. Others will be available soon.

Members of the association will also receive a merchandising calendar listing the various sales aids and merchandising tools which N.C.M.A. offers "to help them in their efforts to capture greater markets for concrete masonry". Among the other items soon to be made available are the following: a series of promotional kits on the use of masonry units in construction garages and outdoor "furniture"; a selection of radio and television spot ads, folders, how-to-do-it sheets, follow-up cards, and sales letters; and an informative folder on displays.

Fire at Campbell Sons' Plant Destroys Main Warehouse

A disastrous fire destroyed the main warehouse of the Harry T. Campbell Sons' Corporation at Towson, Md., on March 12. According to Bruce S. Campbell, president and general manager, the blaze originated from a spark thrown off by a welding torch.

On the following day, Mr. Campbell reports, the crusher was again in operation; and by maintaining a 24-hour, round-the-clock schedule, the personnel was able to send orders out promptly "without losing a ton". The new plant structures replacing the destroyed parts of the plant are of concrete and steel construction.

Mr. Campbell adds an interesting sidelight which must be helpful to other plant owners: "I would advise all operators to take a real good look at their insurance policies and make sure, if they have a co-insurance clause in their policies, that they are insured to the limit, because under the present-day appraisal of replacement value, I am sure that eight out of ten will find that they are far under-insured, as we were."

According to word from J. L. Richmond, president of the Union Concrete Pipe Company, Ceredo, W. Va., this firm has secured a site for a concrete pipe plant at West Palm Beach, Fla. Officials of the concern, which makes plain and reinforced sewer and drain pipe, culverts, and cinder and concrete block, expect to erect facilities at the new site in the near future.

KENT FEEDERS & ELEVATORS

Incorporating Special Features of ADVANCED DESIGN

Kent Elevators and Feeders have been developed thru years of experience in building material handling machinery.

FOR SMALLER CAPACITY requirements Kent also manufacturers the No. 1 reciprocating plate aggregate Feeder which when combined with the No. 139A Top Drive gives the purchaser a low priced, efficient elevating unit.

• • •

KENT ALSO BUILDS CEMENT ELEVATORS

Totally enclosed. Furnished complete with top drive power unit. Have ample capacity to handle Bulk, Truck, or Gondola Car delivery.

KENT CAR UNLOADER

Type FEEDERS for operation under tracks for unloading material from cars. This feeder is built in longer lengths than illustrated at the left.

No. 410
ADVANCED MODEL FEEDER
(Can also be used as Car Unloader)

For handling sand, crushed stone, or lightweight aggregate, etc. from hopper or gondola Car.
It is driven steadily and smoothly by the elevator motor through the elevator belt. Material is continuously fed into boot by long-life rubber belt—pressure, grease lubricated anti-friction bearings — rollers support belt at intervals.
Adjustable hopper gate governs volume of material fed into elevator boot.

No. 139
KENT MOTORIZED ELEVATOR

Constructed entirely of high grade approved materials. All metal except belts.

Unit drive is by electric motor through V-belts. Shafts revolve on anti-friction pillow blocks, pressure grease lubricated.

Elevator is easily attached to bin by means of heavy channels at right angles to main members.

The KENT MACHINE COMPANY
Manufacturers of CONCRETE PRODUCTS MACHINERY Since 1925
CUYAHOGA FALLS OHIO U.S.A.

Send complete information and prices as checked below.

☐ KENT Cement Elevators ☐ The Complete KENT LINE
☐ KENT Aggregate Feeders and Elevators

Name .....
Address ..... City .....

4 EXCLUSIVE ADVANTAGES

AT NO EXTRA COST WITH

WAL-LOK

Masonry Wall Reinforcing Mesh

DEFORMED—Gripping qualities are increased 4.6 times over plain wire. In pull-out tests, the 3/16" dia., 100,000 psi. tensile strength longitudinal bars break, under extreme stress, rather than pull out.

KNURLED—150 indentations per foot .002" in depth grip the mortar like thousands of tiny claws. Improves bonding stress 3.2 times over plain wire.

CROSS BARS PROJECT Welded across Stretcher Rods, Cross Bars project for maximum anchorage in mortar. Cross Bars are welded over Stretcher Rods without annealing Stretcher Rods or impairing tensile strength. ***THICKNESS AT THE WELD ONLY 7/32"***

CORROSION RESISTANT Cross Bars are galvanized for lifelong durability but only that section which is exposed.

POSITIVE PROOF Tests conducted by the Research Foundation of the University of Toledo offer positive proof of these statements. To our knowledge, Wal-Lok is the only masonry Wall reinforcing based on scientific research.

WAL-LOK COMPLIES Wal-Lok reinforcing now complies with the recommendations of the National Bureau of Standard Bulletin 3079, Requirements for Concrete Masonry Construction (Rev. of NBS Report 2462).

WRITE TODAY for your copy of the Adrian Peerless 4-page folder on Wal-Lok. It contains the data from the Research Foundation tests, specifications, additional advantages and further information about Wal-Lok masonry wall reinforcing mesh.

ADRIAN PEERLESS, INC.

1498 E. Mich. St., Adrian, Mich.

License for Rapidex Granted To Spickelmier Company

Under the terms of a recent agreement, the Spickelmier Company was granted a license under Whitacre Patent No. 2,102,447 and under a Vander Heyden patent application which covers the Dox System, and will now manufacture Rapidex concrete slabs for roofs and floors under various patent applications of its own, as well as under this license. The Spickelmier Company has exclusive rights for most of the state of Indiana and the northern part of Kentucky, centering around Louisville, which it now serves from its plant located at Indianapolis.

The Spickelmier Company also has the exclusive right to manufacture or to license others to manufacture Rapidex, in many other important areas throughout the United States.

Sixth Concrete Conference Held in Detroit, April 28-29

At the sixth annual Concrete Conference held on April 28 and 29 at the University of Detroit new design techniques, approved specifications, and a demonstration of recommended construction practices were featured. (The conferences are sponsored jointly by the university and the Portland Cement Association.)

Among the speakers were M. P. Brokaw, regional highway engineer, P.C.A., Indianapolis; P. F. Rice, district structural engineer, P.C.A.; E. B. Oberly, construction consultant, P.C.A., New York; Anton Tedesko, Roberts and Schaefer Company, Chicago; and Roger H. Corbetta, president, Corbetta Construction Company, Inc., New York.

H. A. Lutz, Concrete Specialist Suffers Fatal Heart Seizure

Harry A. Lutz (57), a concrete construction expert, who was associated with the Raymond Concrete Pile Company of New York, died recently of a heart attack in Australia while supervising work on a reinforced concrete pier in Sidney.

Mr. Lutz's duties took him to various locations in North and South America, Africa, and Australia. In 1947 he was decorated by the Republic of Liberia for his part in constructing the Free Port of Monrovia.

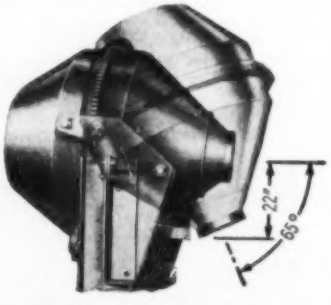
A $12,492 contract for 1,000 ft of 38-in. reinforced concrete pipe and 350 ft. of 36-in. pipe was awarded recently to the Canton Block & Tile Company for sanitary sewers in Sioux Falls, S. D.

Burmeister

"TILT-UP" MIXER

CUTS PLANT HEIGHT AS MUCH AS 8 FEET

Burmeister's patented "tilt-up" feature—which reduces the mixer's headroom requirement—permits lower plant heights. This means easier crane loading, lower power costs, lower initial costs, less costly "conversions," increased portability, and better over-all control.



● In addition to reducing plant height, Burmeister's 3 cu. yd. "Tilt-Up" Mixer (left) provides a steeper 65° discharge from one spot, eliminates segregation of concrete and the danger of accidental discharge. It is simple to install, and has an integral hydraulic system—no compressor is required. Write for name of your nearest Burmeister Distributor, without obligation.

SEND FOR FREE CATALOG

Your copy of Burmeister's new illustrated Catalog is now available. Write today!

COMPLETE PLANTS FROM A SINGLE SOURCE

Burmeister

L. BURMEISTER CO., 4531 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

Trade Notes

R. E. Swarthout

The appointment of R. E. "Cap" Swarthout to the post of vice-president in charge of manufacturing has been announced by Ross Castendyck, president of the Challenge Manufacturing Company, manufacturers of Challenge Truck Mixers. Mr. Swarthout joined Challenge in January, 1952, as chief engineer. In June of the same year he was made works manager and treasurer and also a director.

Mr. Swarthout is a graduate of Stanford University. His professional career began in 1931 as a consulting mining engineer for mining and milling developments in California, Arizona, and Nevada. His experience has been extensive also in earthworks, foundations, and concrete construction on many major projects.

C. I. Bohmer

C. I. Bohmer has been named assistant to the general manager of the Le Roi-Transo truck-mounted mixer division at Dunkirk, Ohio. He will act as an advisor and field research and technical engineer.

Mr. Bohmer comes to the Le Roi Company from the Jaeger Machine Company, Columbus, Ohio, where he served as chief engineer.

Modernization of the Hackettstown, N. J., plant of Bergen Machine & Tool Company, Inc., is progressing rapidly. By means of a production line setup all Bergen Tri-Matic block machines, batch mixers, front pallet returns and skip hoists are being manufactured here. In addition, all parts not made at the Lyndhurst and Nutley plants are being produced at Hackettstown.

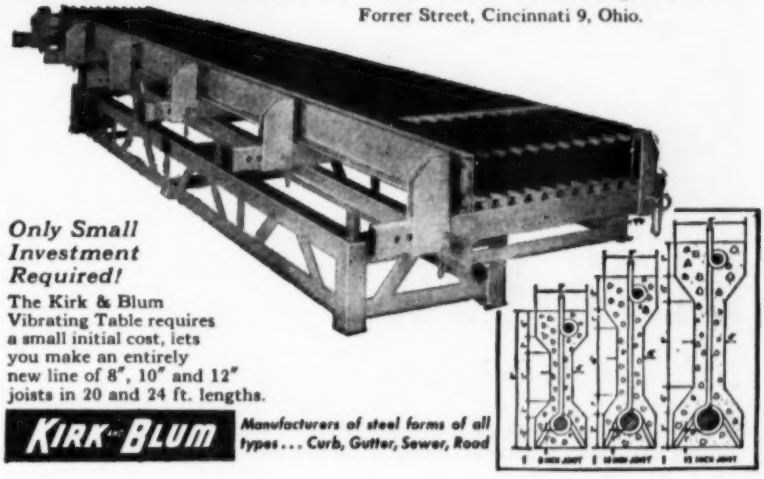
Bergen now has 135,000 sq. ft. of manufacturing space devoted entirely to the production of parts and machinery for the concrete products industry.

Add a New Profit-Maker

Increase Your Volume

PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE . . .

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 81 Forrer Street, Cincinnati 9, Ohio.



Only Small Investment Required!

The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

KIRK AND BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

JUNE, 1954

MORE INFORMATION PLEASE

THE CONCRETE MANUFACTURER
431 S. DEARBORN ST.
CHICAGO 5, ILLINOIS

Please send more information on items described in editorial columns of this issue, as circled below.

101 102 103 104 105 106 107 108 109 110

111 112 113 114 115 116 117 118 119 120

121 122 123 124 125 126

Name_____ Title_____

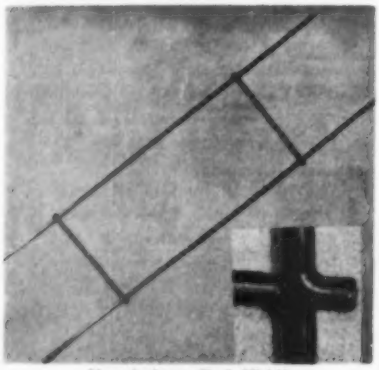
Company_____

Address_____

City_____ Zone_____ State_____

quality guaranteed

MASONRY WALL REINFORCEMENT



(Insert shows Flush Weld)

BLOK-LOK

. . . for better walls

- **flush-welding makes Blok-Lok ideal for small mortar joints**
- **less breakage — strength of rod steel and weld increased**
- **special corners mean no thick joints, better bond, less labor**
- **simple design means less steel, lower freight costs**
- **furnished in 100,000 psi steel for any wall width**
- **ASTM specifications for masonry reinforcement guaranteed**

•

BLOK-LOK Standard — 9 gauge steel wire

BLOK-LOK Heavy — 3/16-in. rod with 9 ga. cross members

Finishes — galvanized wire, hot-dipped galvanized, and brite basic

•

Bonafide lab reports attest to Blok-Lok quality. Copies on request. Send for complete information.

Nationwide Distribution

AA WIRE PRODUCTS CO.
7211 Cottage Grove Chicago, Ill.
RAdcliffe 3-8313

Clark Equipment Company, which manufactures industrial materials handling trucks, construction equipment, and heavy automotive components, has announced plans to erect a new plant on the outskirts of Benton Harbor, Mich.

The 145,000-sq. ft. building will be used as an assembly plant for a new line of tractor shovels to be produced by Clark and for the assembly of power shovels now made in the present Benton Harbor plant. The tractor shovels, to be marketed under the "Michigan" trade name, are the first new items of construction equipment developed by Clark since its acquisition of Michigan Power Shovel Company last May. Components to be assembled at the new plant will be produced at Clark plants in Buchanan and Jackson, Mich. All major components, with the exception of the engine, are manufactured by Clark's Automotive Division.

Garvin Pelsue has been named vice-president in charge of plant operations for The Jaeger Machine Co., Columbus, Ohio. Jaeger manufactures air compressors, pumps, concrete mixers, paving machinery, and tractor loaders. Mr. Pelsue was formerly manager of plant operations for the company.

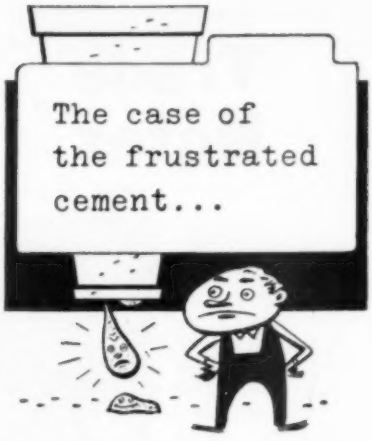
Harold E. Smith, president of The T. L. Smith Co., Milwaukee, Wis., pioneer manufacturers of concrete mixers, passed away unexpectedly on April 20, in Paris, France, while on a vacation trip with his wife.

He was the son of the late Thomas L. Smith, founder (in 1900) of the company that bears his name, and inventor of the famous Smith Tilting Mixer and other construction equipment.

New Chicago C.M. Association Issues Promotional Folders

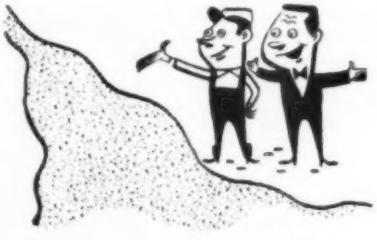
A new organization in the concrete masonry industry of the Midwest is the Chicago Concrete Products Manufacturers Association, 30 N. LaSalle Street, Chicago. Robert Hobart is the association's executive-secretary.

Seeking to capture a larger segment of the residential market, the new association is publishing a series of attractive folders showing unusual uses of concrete masonry units in home construction. Each folder features the work of one particular architect and contractor. Assisting in this project is the Portland Cement Association's Chicago staff.



In a Chicago cement block plant a short time ago, production was really at a standstill. Try as it would, the frustrated cement just trickled through the hoppers and bins instead of flowing along steadily.

But a CLEVELAND vibrator solved the problem. In short order the trickle of cement increased to a flood.



And, we might add, production really got moving too.

Tell us your materials handling problem, or ask for our detailed literature.

AIR *and* ELECTRIC

2710 Clinton Avenue • Cleveland 13, Ohio

Botched Batches

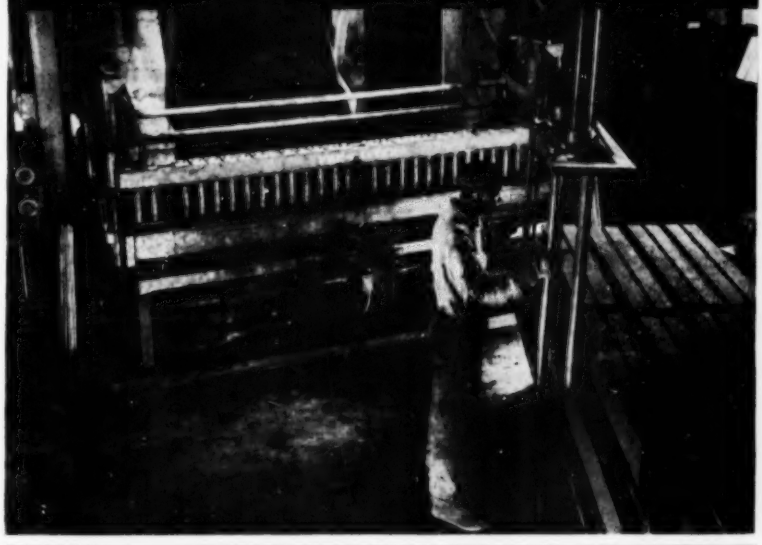
A FELLOW in Washington, D. C., says he has developed a successful method for converting the government 's $1,176,000,000 wheat surplus into wall board for building houses, furniture, and airplanes. Details of the process haven't been announced, but we understand

that in the first stage of production the wheat is puffed up in approximately the same way that puffed wheat breakfast cereal is made. The material is then compressed and fused into planks, one bushel of wheat producing a sheet measuring 4 by 12 fet. by 1 in. thick. It is said to have excellent insulating and acoustical properties.

Far be it from us to try to impede the march of progress, but we want to go on record right now as being unalterably opposed to such nonsense. In the first place a lot of people, including us, are allergic to wheat. We're also sufficiently allergic to the notion of having to mow grass *around* our domicile, without deliberately incurring the additional chore of having to clip a similar growth from the roof and exterior walls after every spring rain. Then there's always the possibility that the kids might take a liking to puffed wheat the instant they realize that they weren't supposed to eat it, a development which would not only raise hell with maintenance and upkeep, but one which would touch off heaven knows *what* claims and counter claims by rival manufacturers concerning the vatimin-, calory-, butterfat- and chlorophyll-content of their various products.

enjoy PreCaster profits
from hard-to-make units like lintels

Be the first in your market to offer quantity production prices on concrete units that will strip through a straight box . . . slabs, highway guard rails, fence posts, joists, etc. *Relatively low investment! One man operation!* Write PreCaster Inc. · 5209 Beech Street · Cincinnati 17



3 ADVANTAGES of the ANTHONY
Continuous Mixer

- **1. Power requirements are actually less than 1/5 that of batching operations. No "peak" loads involved. No great weight of material in trough.**
- **2. Minimum blade wear because of light loads in trough. Low replacement costs.**
- **3. Replacement of trough often not required for 20 years, even if material is highly abrasive.**

CONSTRUCTIONAL FEATURES: Completely adjustable blades—64 in one mixer. 12 foot standard replaceable mixer trough. All welded, heavy steel plate frame. Mixer will handle any dry or semi-dry material. Five sizes available.

High production machines such as this include installations at: General Block & Supply Co., Detroit, Mich. Grays Ferry Brick Co., Conshohocken, Pa.

THE W. A. ANTHONY ENGINEERING CO.

2819 Detroit Avenue, Cleveland, Ohio
Phone: Cleveland, Ohio—Cherry 1-6308

Engineers and Designers of — Moisture Determination Equipment • Constant Volume Feeders • Conveying Equipment.

Concrete Manufacturer Classified Section

431 S. DEARBORN ST., CHICAGO 5, ILL.

Advertising Rate Per Issue: $10.00 a Column Inch. Lower Rates on a Contract Basis — Write for Rate Card.

LOWER COST

PACKER-HEAD WINGS

Proved to last as long or longer — yet cost considerably less. Write for prices.

TEXAS FOUNDRIES
LUFKIN, TEXAS

WANTED

Several Concrete Mixers mounted on trucks two to six yards.

BLUE RIDGE FUEL CORP.
1400 Moreland Ave. Baltimore 16, Md.
Phone: Le. 6-8200

WANTED TO BUY

Good used BLYSTONE mixer.
5 or 6 yds.

BOX NO. E—60, c/o
THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

BUILD GOOD WILL

Advertising necessities for the block industry. Line Pins, Twigs, Modular Coursing Stick. Also the new Block Calculator and Wood Corner Block. All imprinted with your advertising. Complete catalog on request.

GERSON CO.
97 Dearing Road Mattapan, Mass.

FOR SALE

Rehberge Block Unloader. Will handle 8 cubes of 72 or 90 - 8" units. First Class condition.

CONCRETE PRODUCTS CORP.
2700 W. Ewing Avenue
Mishawaka, Indiana
Phone 5-1313

CEMENT COLORS

Write for free samples and prices of LANSCO CEMENT COLORS produced in 24 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

manufactured by
LANDERS-SEGAL COLOR CO.
71 Delevan St. Brooklyn 31, N. Y.

FOR SALE

Concrete Products & Ready-Mixed Concrete Plant. Located in one of the fast growing industrial areas of central South Carolina. It is equipped with late model Besser block machine, 6 mixer trucks, and all other handling & Delivery equipment. It is now in operation, and has been operated for 2½ years. A modern designed plant. Present sales approximately $450,000 per year, should certainly grow. Ideal size for Owner-Management. Reason for selling: Owner is Manager, also has other management duties in larger plants. Wishes to slow down due to age, etc. Will sell reasonable, terms if desired. Complete information furnished upon inquiry.

BOX NO. D-54, c/o
THE CONCRETE MANUFACTURER
431 South Dearborn Street Chicago 5, Ill.

WANTED

Leading northern Ohio building material producer and distributor has opening for experienced salesman, with engineering knowledge, to sell and promote the use of concrete products. Permanent position. Reply—giving personal, educational, business background, age and salary desired.

THE CONCRETE MANUFACTURER
Box No. H-71, c/o
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

One 3 yard Smith concrete mixer (4½ yard agitator) mounted on Ford F-8 truck in good used condition and operating in our fleet daily. We have too many 3 yard trucks and not enough 6 yard trucks. Will give reasonable terms if desired.

GRAYSON LUMBER COMPANY
P. O. Box 1311 Birmingham, Alabama

WANTED

Used Block Machines, Mixers, Elevators, Pallets, or any other type of Concrete Equipment in any kind of condition. Interested in renting site or space for Block Plant.

BOX NO. C-37, c/o THE
CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Illinois

FOR SALE OR LEASE

Complete Go Corp. King Block Machine Plant Equipment, including 75 Ft. mixer, racks, pallets, lift trucks, and all attachments. Can be shipped anywhere. Less than one year old. 25% discount. TERMS.

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PALLET RINGS

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If you have not found the equipment you are looking for, the research dept. of The Concrete Manufacturer can and will gladly assist you. Tell us what it is . . . Write to

Research Dept.
C/O The Concrete Manufacturer
431 S. Dearborn St. Chicago 5, Illinois

IDLE EQUIPMENT WASTES MONEY

A good way to get back a large part of the money you spent for equipment you're no longer using is to SELL IT.

And, the best way to sell it is through the Concrete Manufacturer, the Market Place for supplies and services.

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Tell us what you have to offer for sale or trade, we'll set up the ad for you. Mail today and watch the results.

THE CONCRETE MANUFACTURER
431 South Dearborn St., Chicago 5, Ill.

CONCRETE MANUFACTURER CLASSIFIED SECTION

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BESSER "SUPER" VIBRAPAC

Available for immediate delivery. A-1 condition, Steam cleaned and Painted. 8" atachment and height control.

BOX NO. H-70, c/o THE CONCRETE MANUFACTURER

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Concrete Block Manufacturing Plant. Located in Rogers, Arkansas. Center of second largest poultry producing area in U.S. This plant will produce 1500 8x8x16 blocks every 8 hours. Approx. 3000 sq. feet of floor space. Curing rooms, R.R. siding, ample yardage. This is a most complete plant with all machinery in A-1 shape. Excellent trade territory. Potential business unlimited. Owner compelled by health from taking further active interest. Price of building and all equipment, only $18,000. Owner might consider selling equipment and leasing building. For complete inventory of equipment and pictures of plant, write L. B. Greene, Realtor. Exclusive Agent. Box 307, Rogers, Arkansas.

FOR SALE

1—No. 9 Joltcrete Block Machine wit hattachments, Pallets and racks.

1—Dunbrick Brick Machine, Racks and Pallets.

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FOR SALE

Besser "Super" Vibrapac 1947 Model, A-1 condition. Can be seen in operation.

CALABRIA CONCRETE PRODUCTS COMPANY
R.D. #1, Kane Road, Aliquippa, Pennsylvania
Telephone: ES 5-3342

FOR SALE

1300—7⅝" Pressed Steel Pallets
750—4" Pressed Steel Pallets
1—Barrett-Cravens Hand Lift Truck
25—Wood and Steel Racks
1—Bag C-G Mixer
All at 50% of cost.

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VIBRAPACS FOR SALE

2—8 Year old Vibrapacs, excellent condition. May be seen in operation, running at 945—8" per hour. 10 H.P. Plugged Vibrator motors. Reconditioned in February.

Bergen Building Block Inc.
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BRICK MORTAR
STUCCO-PLASTER-CONCRETE
"Fine Because of Their Fineness"
Ask for samples and recommendations.
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Joltcrete & Equipment

1—No. 9 Joltcrete 45% void pallets, racks, turntables, air offbearer and mold boxes for the manufacture of 4", 8", 12" concrete and cinder block. This equipment is in excellent condition. Also spare motors and parts for the above equipment. Daily average production per 8 hour shift in 8" equivalents was:
Concrete units 4320
Cinder units 5760

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All shades and grades the highest quality.
Write for color cards, prices and samples
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Established 1885

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2—L-5 Lith-I-Block Machines. Three block per cycle and fully automatic. Immediate delivery. Can be seen in operation at our plant. Contact:

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Truckman Model D platform truck, reconditioned like new. New Rubber. Power lift. $650.00.
Clark fork lift truck. Pneumatic tires. Excellent condition.
Lith-I-Bar 2½ years old. 4" 8" 12" attachments. Chimney block attachment. 2260 18"x18" pallets. 62 racks. All for $6,000.00.

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1—Besser K 3 Tamper block machine
2500 12½ x 17 plain pallets
40—Block Cars
1—25' cubic foot mixer and skip hoist
1—Lewis & Shepard three ton battery lift truck
1—Godfrey Track conveyor
1—40' — 18" belt conveyor
1—55' — 18" belt conveyor
1—Bonded cinder crusher
1—Vibrating screen
1—Ding's Magnetic separator
Plus all motors, switches and controls for above equipment.

"SAMSON" BLOCK COMPANY
Foot of East Ninth St., Lorain, Ohio

F & A EQUIPMENT FOR SALE

6 Multiple Vibrator Cradles
12 Air Vibrators
12 6" Alum, Forms x 30'-0"
16 8" Steel Forms x 30'-0"
16 Clamps
1 Mold Box For 2-8" Blocks
1 Set Vibrators For Mold Boxes

This equipment is in excellent shape and priced 25% below replacement cost. Direct all inquiries to:

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MODERN HIGH PRESSURE DRUM CURING SYSTEMS
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FOR SALE

Columbia Model 8-Semi-Automatic with Pallet Feeder and agitator, Air Off-Bearer, and Compressor. 8" x 8" x 16" and 12" x 8" x 16", Attachments, 6" x 8" x 16", 4" x 8" x 16". 900 Steel Paliets. Machine 21 months old. Well taken care of. Run on an average of 6 hours per day. Check this equipment before you buy. Terms can be arranged.

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SCOTTSBORO, ALA. P. O. Box 366
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STOP *that* WATER
With FORMULA NO. 640
A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—*free* sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE

One block machine, Stearns Model A. Clipper Stripper.
8 x 8 x 16 standard mould box.
8 x 8 x 16 rock out type rock face and panel face mould box.
Mould box to make 2 - 8 x 4 x 16 blocks.
8 x 12 x 16 mould box
All complete with attachments.
F.O.B. our yard $750.00

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1—2 yd. Smith Mixer, Waukesha Engine power, mounted on a 1948 International Single axle, recently repainted, good condition.

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All priced right, ready to go.

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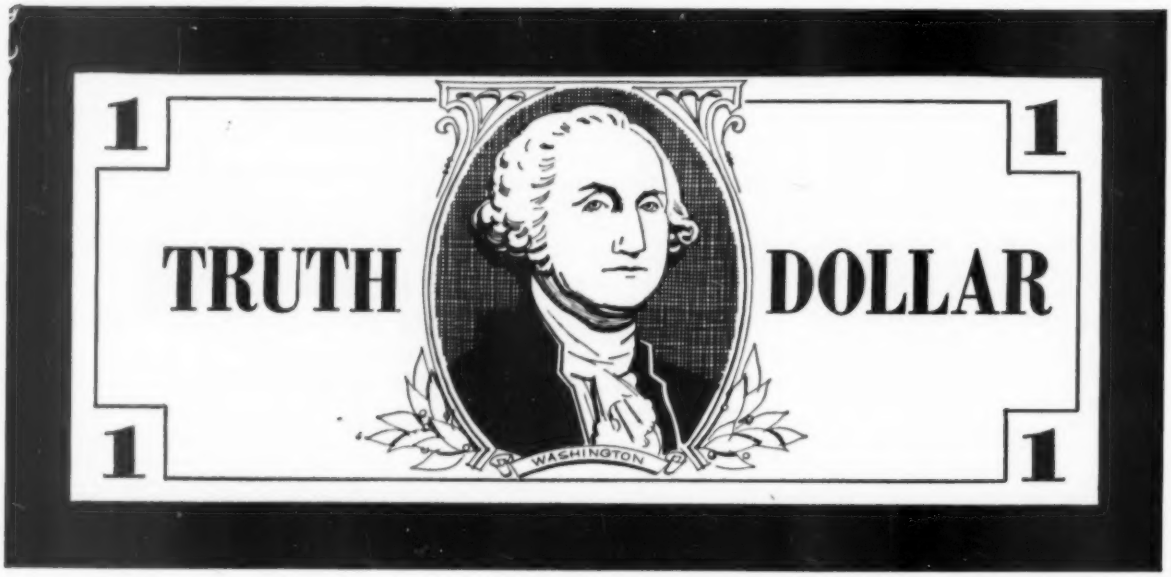
"let George do it"

Here's one time when, in all conscience, you can . . .



How $1 for Radio Free Europe can help stop World War III before it starts.

Take a look right now at one of those green pieces of folding money in your pocket. It features the portrait of the world's greatest symbol of Truth.

With that single dollar you can send 100 words of Truth through the Iron Curtain—Truth to 70,000,000 people who are being told lies about you!

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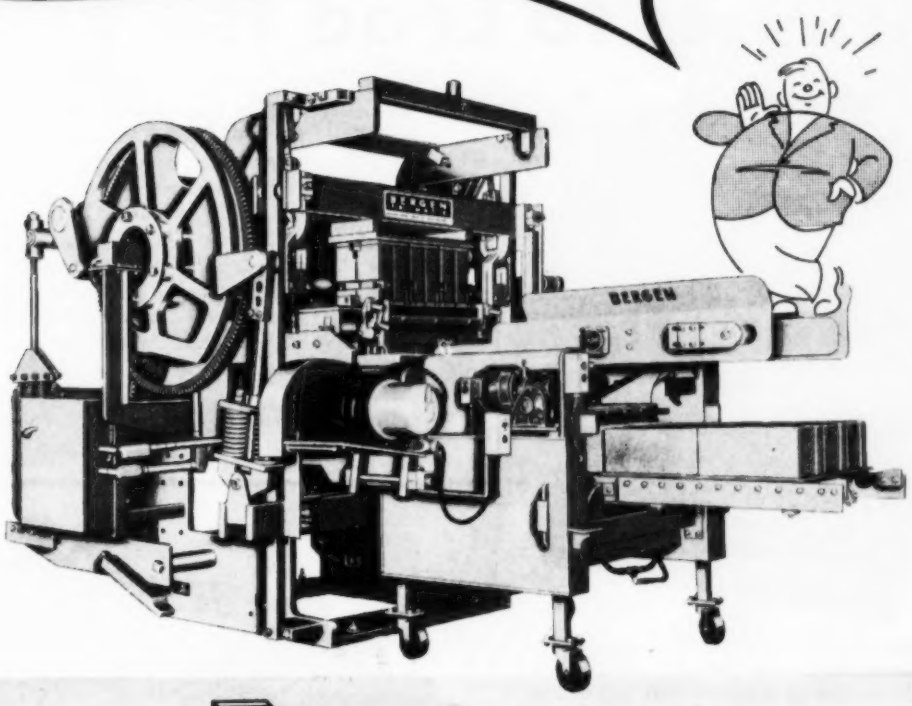
WE'RE PROUD TO SAY . . .



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A
BERGEN TRI-MATIC
is available 4 WAYS

1. With or without Front Pallet Return.
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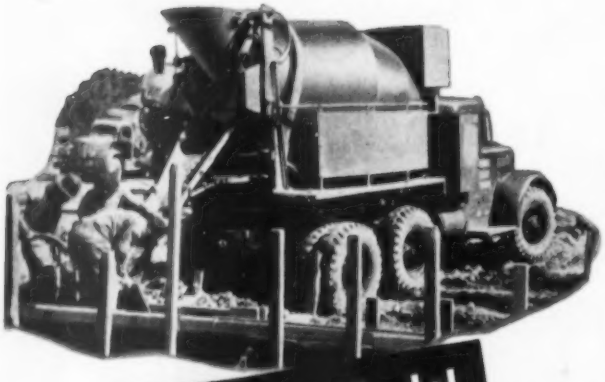
189 FRANKLIN AVENUE
NUTLEY, NEW JERSEY

BRAND NEW TIME-TESTED TRUCK MIXERS

2 Reasons Why SMITH Continues to Lead the Field!



DELUXE Model
— the Finest Truck Mixer that Money Can Buy

You want nothing but the best. Then be sure to investigate the new Smith De Luxe Truck Mixer. It's a brand new mixer, completely redesigned for even greater efficiency. This De Luxe Model weighs 500 lbs. less than the previous De Luxe. Overall length is much shorter. Better weight distribution allows bigger legal payloads. New 2-speed transmission, built to aircraft specifications, has lifetime Helical gears, ground shafts and multiple disc clutches running in oil. The entire engine is easily accessible. All this, with no increase in price. And remember, this De Luxe Model is backed by a company that enjoys recognized leadership in the industry.

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the First Low-Cost High Quality Truck Mixer

If you want to combine economy with top quality, the Smith Premium Model is the answer. It's NOT built down to a price. In fact, it's the world's finest truck mixer, except for the Smith De Luxe Model. This Premium Model is 800 lbs. lighter, size for size, than the De Luxe. Overall height is cut down to get under bins with low headroom. Features include dependable 2-speed transmission, drum speeds from 3 to 15 r.p.m., and dual push button water control — front and rear. Price? Believe it or not, it's MUCH LOWER. You save hundreds of dollars and still get top quality.

Both of these Models are built to the usual Smith high standard of quality. That's why Smith continues to lead the field. It will pay you to investigate. Contact your nearby Smith dealer — today. Ask for literature.

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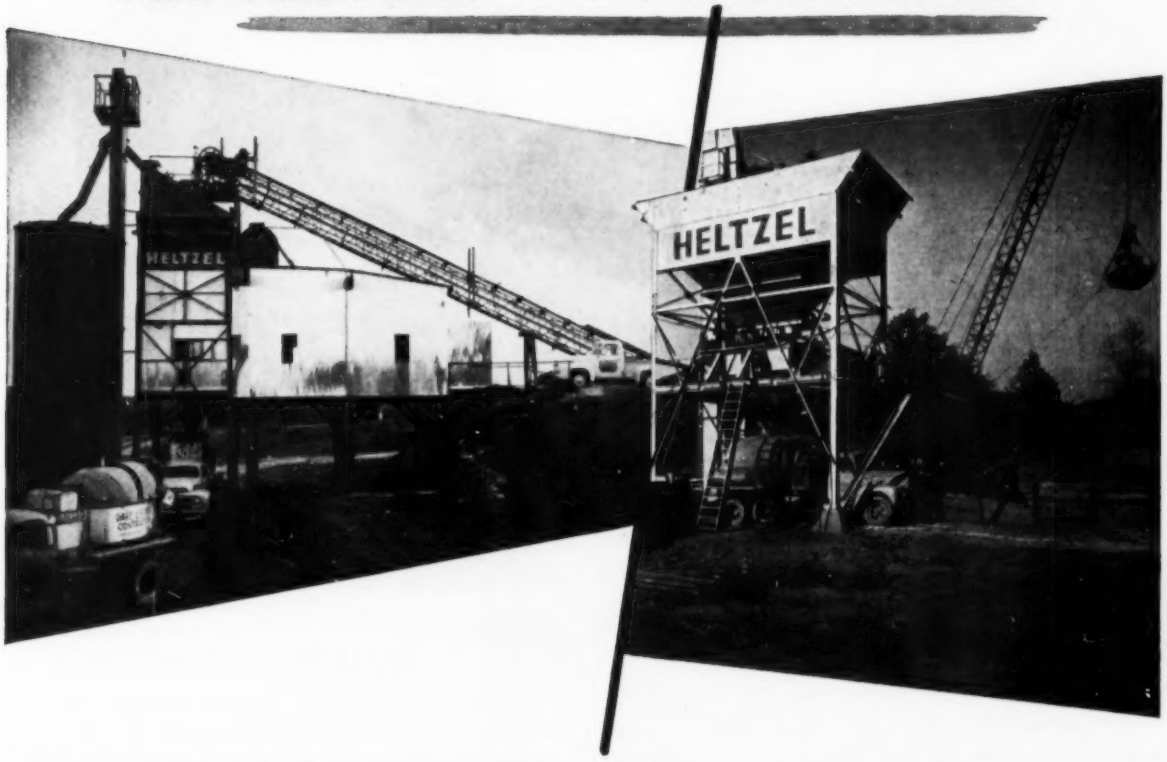
For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH

The HELTZEL TYPE-TWO PLANT



BIG PRODUCTION *Where You Want It!*

This is no "Fancy Dan" piece of equipment. It's a big 200-ton capacity husky that can be quickly erected and dismantled, moved from job to job in large, easy-to-handle sections.

It's fast and accurate . . . no holdups or fouled batches. It's the big, versatile, hard-working plant designed to keep pace with modern concrete construction. It takes any type batcher, including the new Heltzel Automatic Push Button.

If you're in the market for big, high-production, portable equipment, check this **Heltzel Type-Two Plant** before you buy. It's available in the cement-aggregate design, or for aggregates alone. There are batchers, cement plants, elevators, conveyers—everything you'll need, designed to work with it.

THE HELTZEL STEEL FORM and IRON CO.
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WARREN
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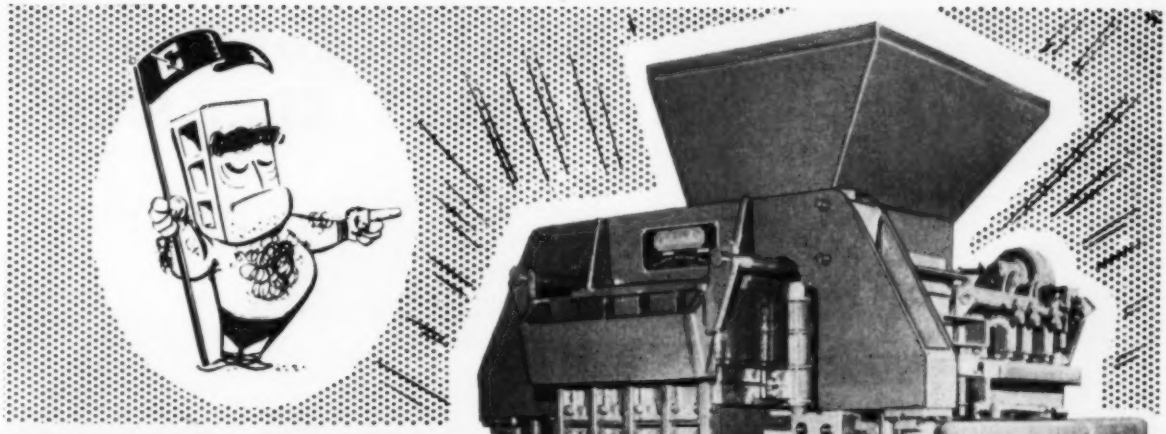

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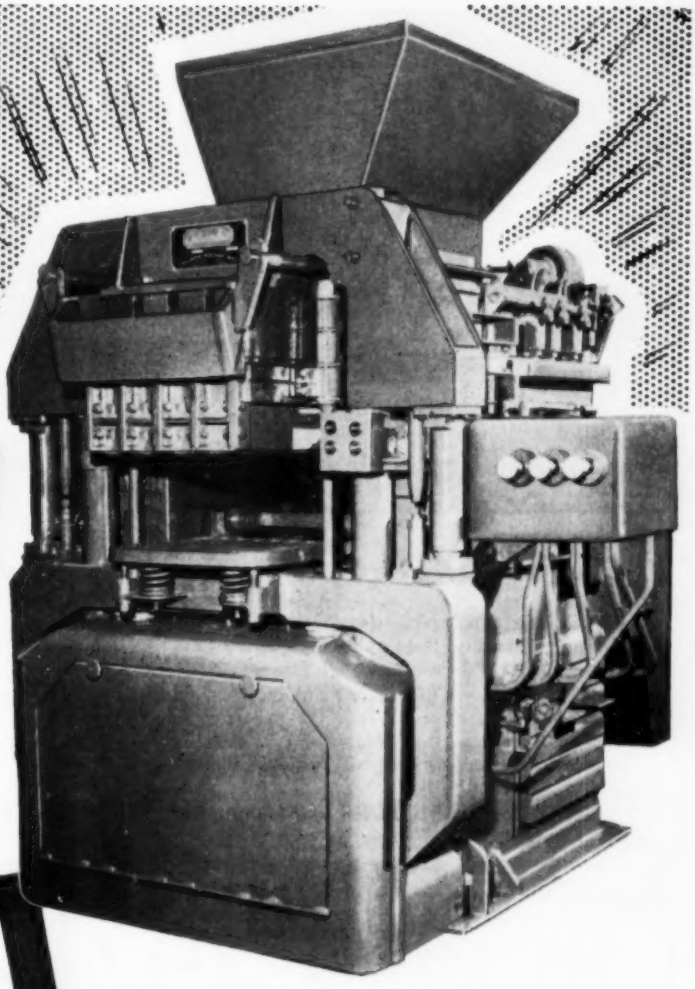
DEPENDABLE!

Columbia

MODEL 8 2-BLOCK

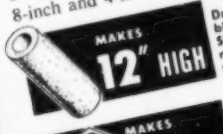
We designed a machine rugged enough for years of uninterrupted production... then added *extra* strength to every member!



ask for information about *Columbia's* **12" HIGH COMBINATION...**

2 AND 3-BLOCK MACHINES

...the only machines that give you production of any desired shape in 12-inch, 8-inch and 4-inch heights!



MAKES **12" HIGH** — Drain tile... Partition blocks... Flue liners... Silo staves... Water meter boxes... Other shapes!

MAKES **8" HIGH** — Standard and special concrete blocks in all shapes.... More than 240 molds available!

MAKES **4" HIGH** — All normal blocks in the popular 4-inch height.

Same rugged construction, same automatic features as the world-famous Model 8 and Model 12.

Long-life performance... the result of really rugged engineering and construction!

Lower maintenance costs... fewer production delays...longer service life...more operation at higher cycling speeds... GREATER PROFITS for each dollar of investment and payroll.... These are the benefits of Columbia's advanced design and rugged construction!

- **4-6 Cycles Per Minute**
- **Fully-Automatic Electronic Controls**
- **Vibration Under Pressure**
- **Standard Plain Pallets**

District offices in: Wisconsin, Ohio, South Carolina, Mississippi, Florida, New Jersey, Virginia, California, and Massachusetts.

Write today for Columbia catalog!

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON

Factory Branch and Warehouse at Mukwanago, Wisconsin

BEALS *Automatic* PALLET CLEANER

PATENT APPLIED FOR

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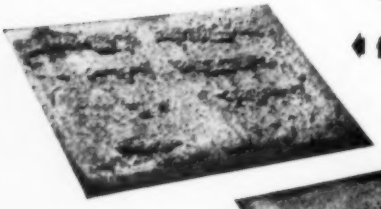

to this

Cleans pallets as they are used in your cement block caster

Note that double spiral cleaning roll — it is *power driven* and positive. Picks up each pallet from the conveyor chain, as it comes along. Planes off adhering concrete right down to a smooth surface. Then deposits cleaned pallet back on the conveyor chain for uninterrupted delivery to the mold box. Will not bend or deform pallets. Will take feather-edged pallets.

Beals Automatic Pallet Cleaner fits most automatic cement block machines now in use. Installed in a single day; lasts as long as the machine itself. Requires no special upkeep or attention. Costs so little that it pays for itself in the very first month of use. Prompt delivery assured. Installation service available. Information on request. Write today for descriptive circulars.

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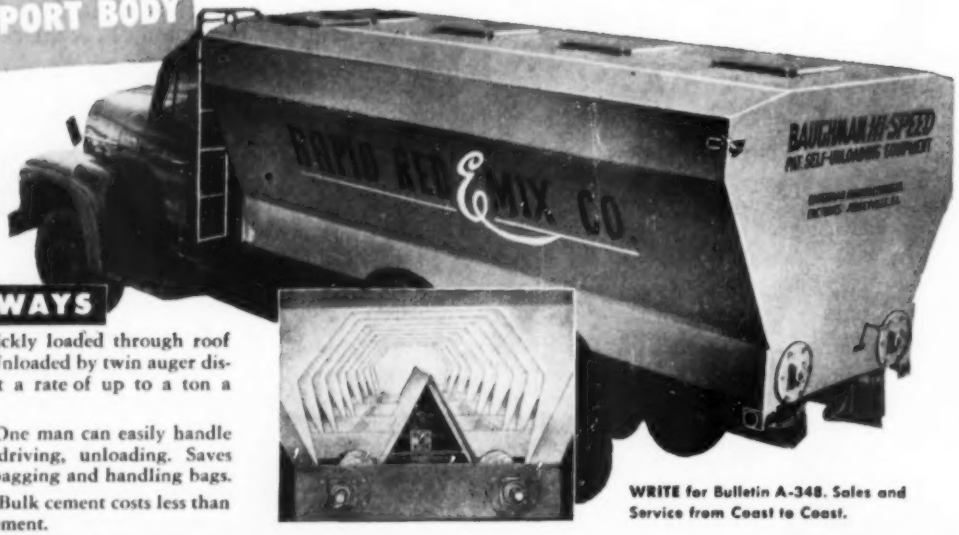
the BAUGHMAN BULK CEMENT TRANSPORT BODY MOVES BULK CEMENT *the fast, modern way!*



Shows patented air cell construction over twin 9" augers which makes starting easier and speeds discharge of cement.

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TIME—Quickly loaded through roof hatches. Unloaded by twin auger discharges at a rate of up to a ton a minute!

LABOR—One man can easily handle loading, driving, unloading. Saves labor of bagging and handling bags.

MONEY—Bulk cement costs less than bagged cement.

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BAUGHMAN MANUFACTURING COMPANY

130 Arch Street • Jerseyville, Illinois

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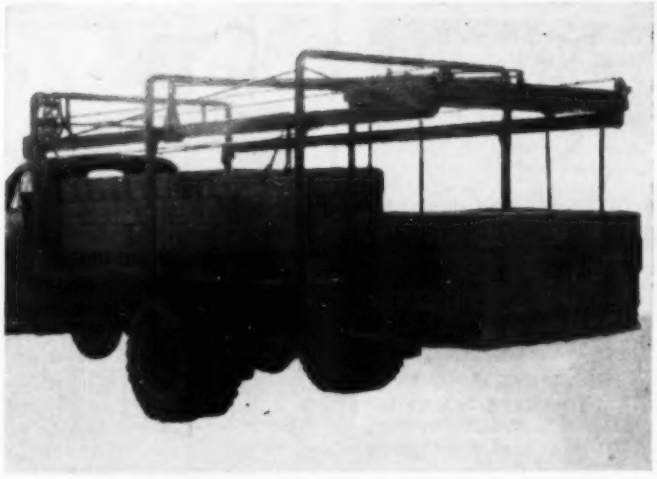

Weighs Less than fifteen hundred pounds

Delivers a perfect block — No corners broken.

PATENT PENDING.

Positive hydraulic-power driven by engine Power Take Off. Perfect control of load at all times. Unload one lift per minute.

PRICE WITHIN BUDGET OF EVERY MANUFACTURER

The HYDRO-LIFT

- ✓ Will reduce delivery cost and pay for cost of installation in six months time.
- ✓ Will reduce your truck investment fifty per cent.
- ✓ Will deliver as many blocks as two or three men unloading by hand. DEPENDING ON LENGTH OF HAUL.

Write G & H MACHINE COMPANY

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has improved the efficiency and production of many plants

Write for OSWALT BOOKLET Today!

What it is

OSWALT SERVICE boosts production of your vibrapac without sacrifice of quality. This result is achieved by methods originated by Oswalt engineers after many years of research and actual tests in plant operation.

Complete Oswalt Service includes:

Improved Vibration and Machine Changes that increases output 50% or more.

New Simplified Control for Height and Density of Block.

New Shock-Free Block Ejector and Front-End Pallet Feeder which help to eliminate cracking.

Why it pays

When your vibrapac machine is completely Oswalt-Serviced, you are assured of the "know-how" and experience which have produced satisfactory results in scores of plants.

Oswalt Service pays for itself in maximum output, better quality blocks, improved plant efficiency, lower operating costs and bigger profits.

What you pay for Oswalt Service not only comes back in terms of greater production, better quality, high plant efficiency and lower costs . . . but helps to further the research for future improvements and developments.

Many satisfied customers operating scores of machines.

Write for name of Oswalt-Serviced plant nearest you.

OSWALT ENGINEERING SERVICE CORP.
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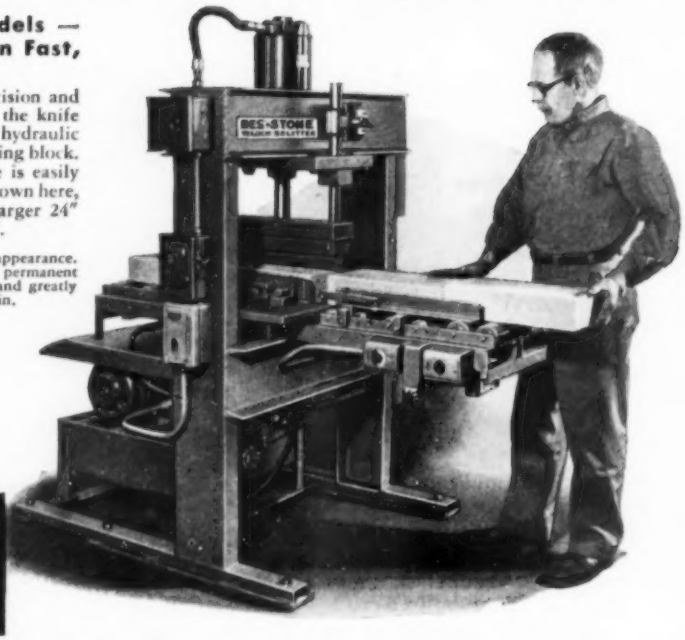
BES-STONE Block Splitter

Made in 2 Sizes — 18" and 24" Models — Produces 960 Split Block per Hour in Fast, Automatic Operation

Splits block in a straight line, with speed and precision and with the utmost safety. The block is placed under the knife automatically . . . the blade descends with a smooth, hydraulic action . . . and the split block is ejected by the incoming block. The operator is always at a safe distance. Machine is easily adjusted for various block heights. The 18" model, shown here, splits block 16" or 18" long, 1⅝" to 8" high. A larger 24" model splits any length up to 24", heights up to 8".

BES-STONE is a new masonry unit with a quarried stone appearance. Can be produced in many sizes and in a series of attractive, permanent colors. No conflict with conventional block. It complements and greatly increases sales of standard stripper block. Write for Bulletin.

BES-STONE
the Split Block with Character



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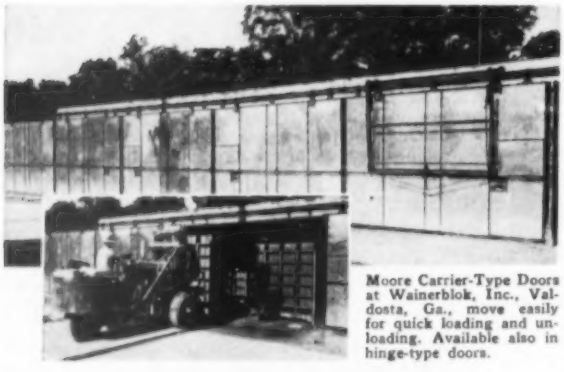
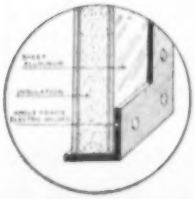
A 7571-½-H



Moore Carrier-Type Doors at Wainerblok, Inc., Valdosta, Ga., move easily for quick loading and unloading. Available also in hinge-type doors.

Moore Metal-Insulated Kiln Doors Save Fuel—Reduce Curing Time



Keep heat where it belongs—inside the kiln—with Moore Aluminum-Insulated Doors. They improve curing conditions—save steam—last longer.

Send us dimensions of present door openings for quotation.

MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

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SPEED PRODUCTION — AVOID INJURIES WITH GS SAFETY MITTS . . .

for protection while handling blocks, brick, tile, etc. Workmen like GS heavy thumb-style chrome leather hand pads, sewed with steel thread for extra wear.

GS-1205 — $12.40 doz. pr.

GS-805 with palm patch — $17.40 doz. pr.

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Street.....

City.....Zone.....State.....

Above: Universal Doors and Carriers at Patterson Supply Co., Monongahela, Pa.

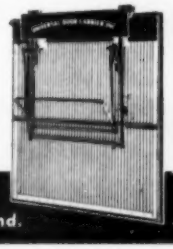
CAN *cut your costs per block—and improve your quality-uniformity*

Block plants the country over are reducing the cost of curing and stepping up quality-uniformity by installing modern, efficient, kiln closure equipment. They have found it *stops costly losses of heat and steam* and helps *achieve uniform curing conditions.* Why not investigate—

Universal

fully insulated, all-metal **DOORS** *and world-famous* **DOOR CARRIERS**

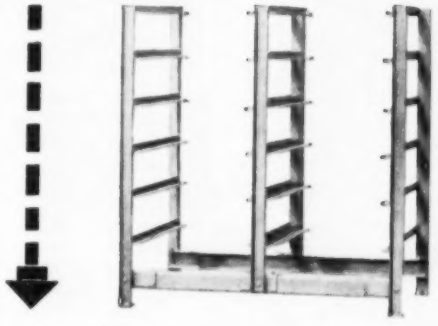
50th Anniversary 1904-1954



UNIVERSAL DOOR CARRIER, INC.
1117 Corneil Ave., Indianapolis 2, Ind.

CHASE BLOCK RACKS

Your best buy



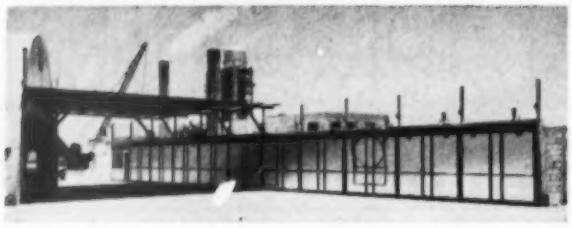
Here's why . . .

Standard style or specially designed, Chase racks meet your requirements. They're shipped painted and knocked down—assembly is easy—no special tools or welding needed. Chase experience means low prices and years of dependable service.

Send your Rack and Pallet specifications to Chase.

Chase FOUNDRY & MANUFACTURING CO.
2300 PARSONS AVENUE • COLUMBUS 7, OHIO

SAVE FUEL • REDUCE CURING TIME
• CUT COSTS • UP PROFITS
with *Standard* KILN DOORS!



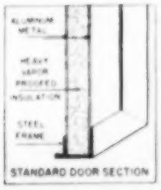
● This is the modern STANDARD kiln door installation of Portland Industries Inc., Riviera Beach, Florida. C. R. Wilson, the firm's Executive Vice President, writes: "Our Standard kiln doors have been very satisfactory."

To suit your individual requirements, three types of STANDARD kiln doors are available—the sliding carrier-type (shown above), the top hinge-type (which is pulled up by a hoist), and the side hinge-type.

CHECK THESE FEATURES

√ Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.

√ Rugged Steel Frame.



STANDARD DOOR SECTION

Get the Best — Send for Details Now
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P. O. BOX 5708 . . . . INDIANAPOLIS 21, IND.

Let
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MANUFACTURING COMPANY
show you how to build
BIG PROFITS
for SMALL PLANTS
with the famous FMC-180

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PRICES, TERMS
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FMC-180 automatic concrete block machine
FMC-400 fully automatic double block machine
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(Filler for Floors and Roofs)
Opens Up New Markets

• FIRESAFE
• PERMANENT
• RIGID
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Gives FLOORS and ROOFS Lifetime Permanence . . . Cuts Construction Costs!

Your profits will greatly increase by making and selling Soffit Filler Block for floors and roofs. Soffit Block enables your customers to make an ENTIRE structure firesafe and permanent, and do it economically.

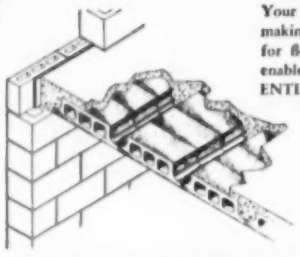
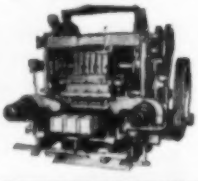


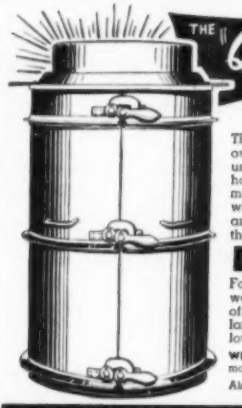
Illustration at left shows integral joist and slab of reinforced concrete. Meets standard building code requirements. Recommended by architects and builders.

BESSER VIBRAPAC



Soffit Filler Block are made on the same machine that produces quality concrete load-bearing block for walls, in all styles and sizes, using one set of Plain Pallets. Write for literature and names of Vibrapac plants making Soffit Block.

BESSER MANUFACTURING CO.
ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Products Plants



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FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

Also manufacturers QUINN CONCRETE PIPE MACHINES

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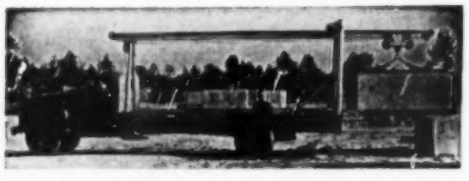
CARPENTER.

The Name to Remember for PROFITABLE SEPTIC TANK FORMS AND HANDLING EQUIPMENT



Build quality septic tanks the modern, high-speed, economical way with CARPENTER Units. There is a good market near you for this premium product! One man loads, transports and unloads using our delivery rig. Satisfied customers throughout the country. *Write for Catalog.*

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- Clean Equipment
- Scrape Dry Concrete
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Weight only 50 oz. 6 in. length, fits hand easily. Exclusive metering trigger delivers 0 to 9000 blows per minute. 28 tools available for 100 different jobs. Special tools made at your request.

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NO SEAM HERE
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CARROLLTON, OHIO

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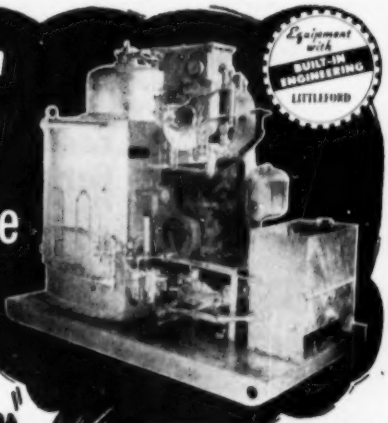
Modern Curing FOR Concrete Block



"Kwik-Steam" GENERATOR

Curing Concrete Products by Steam now can be done the "Low-Cost" way by using a Littleford "KWIK-STEAM" Generator. These compact units are the fastest steam-producing generators ever designed, they deliver steam in 2 minutes' time from a cold start, and only operate when steam is needed. Being fully automatic they require little attention and do not need a specially trained operator. Made in models to fit any curing space; sizes range from 20 to 165 B. H. P.

Cut your curing time and curing expense, have a "KWIK-STEAM" Generator on the job.

LB LITTLEFORD

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Make Money Manufacturing CEMENT DRAIN TILE

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Tile made on the Champion are outstanding in quality—dense, strong, uniform. Far better than clay tile, yet can sell for less—even after allowing a handsome profit on manufacturing operations. The Champion machine is simple, compact, easy to operate.

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- long-life carburized steel knuckles
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All-welded BUCKETS

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Here's Your Big Money Maker!

One machine to make drain tile in all the popular sizes. **TURN CONCRETE INTO GOLD SHECKLES** with the **MARVEL 8.**

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Concrete is BIG business, today

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The CONCRETE MANUFACTURER, a section of PIT AND QUARRY, each month carries the latest news on developments in the big new industries devoted to ready-mixed concrete, concrete block, pipe and other precast units.

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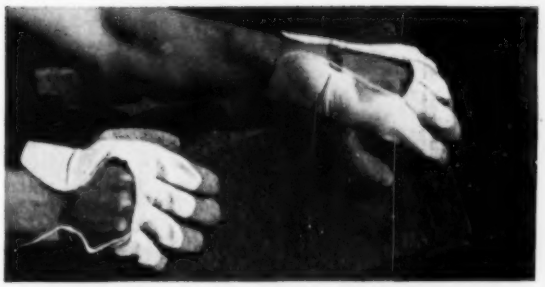
You'll find The CONCRETE MANUFACTURER a gold mine of information on this basic field.



Palm-coated gloves for concrete products plants

LONGEST WEAR
By actual test, Nos. 31 and 304 Monkey Grip, with "triple-thick" palm, outwear all others handling block.

Tougher than leather. Comfortable as canvas.

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- Reichard-Coulston synthetic and natural cement colors are limeproof.
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Choose from a wide range of Reichard-Coulston natural and synthetic cement colors: reds, yellows, browns, green. For FREE color card, write today.

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FACTORY: Bethlehem, Pa.
OFFICES in Boston and Chicago
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FREE Color Card

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Attention_____

Street_____

City_____ Zone____ State____

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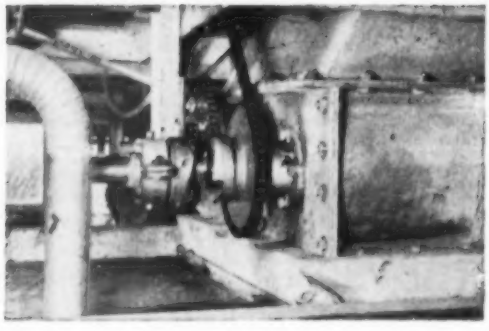
Yes, it's PROVED!

A prominent block manufacturer in Pennsylvania (name on request) in 8 months used $500,000 worth of cement. All was batched through manual equipment. At the end of the 8 month period he showed a shortage of 8% or $40,000 worth of cement.

This was due *entirely to the human element in batching.* The equipment itself functioned perfectly.

Then he installed a BUTLER Automatic Weighing Batcher. From the first day of operation shortages have been eliminated entirely.

The automatic equipment cost him $2000.00. He is saving at the rate of $40,000 every 8 months over his previous operation!



Two Butler Rotary Feeders insure accurate batching of costly cement — *everytime.*

NOW...

if automatic batching is important in block plants, it's just as vital in the Ready Mixed Concrete Industry.

Simple, rugged automatic controls provide high cement savings.

ROADBUILDERS!

Today, automatic batching is specified in many of the nation's highway programs. The trend is there. Accuracy is economy.

BUTLER AUTOMATIC CEMENT BATCHERS . . .

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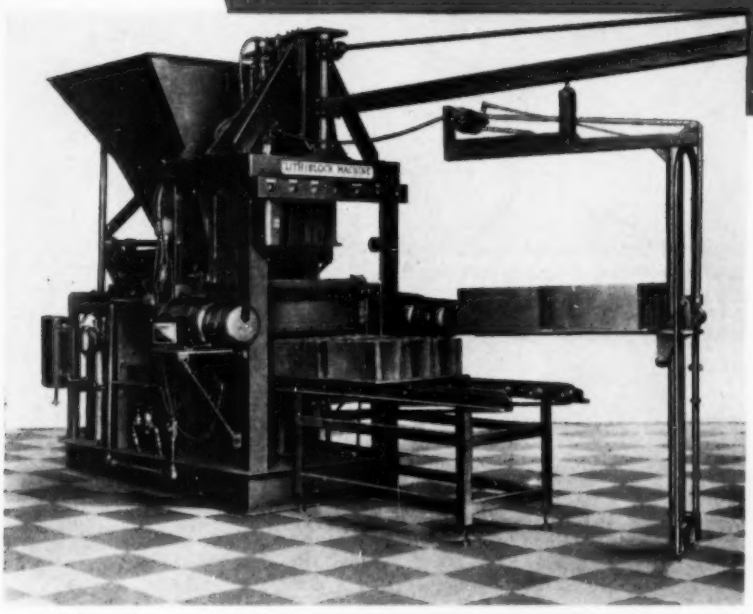
FIRST-QUARTER BUILDING STARTS HERALD ANOTHER BOOM YEAR*



* Latest reports from Government and Building Industry research groups.

TURN THIS MARKET INTO A GREATER PROFIT WITH LITH-I-BLOCK MACHINES THIS YEAR

You save most to begin with...

Dollar for dollar, you earn a greater return on your investment in Lith-I-Block Machines. You get the full advantage of modern, time-tested engineering; save the expense of obsolete casting, gears and cams. And Lith-I-Block design eliminates the cost of complicated pits and foundations for even more savings. You get a complete machine that's ready to go, ready to begin profitable production this year when you specify Lith-I-Block.

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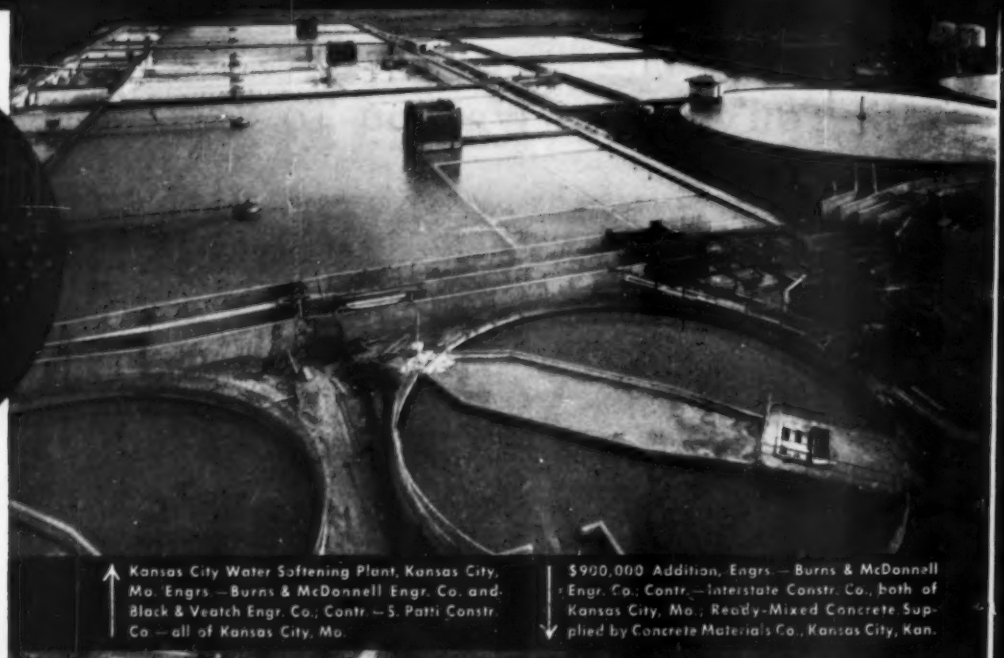
HOLLAND MICHIGAN

YOU CAN GET YOUR LITH-I-BLOCK MACHINE INTO PRODUCTION THIS SUMMER

Both the three-block L-5 and the two-block L-3 are self-contained units. They can be installed and running in jig time. So get the facts you need. Write or phone for specifications, costs and delivery schedules.

built in
1941
concrete in excellent condition



Kansas City Water Softening Plant, Kansas City, Mo. Engrs.—Burns & McDonnell Engr. Co. and Black & Veatch Engr. Co.; Contr.—S. Patti Constr. Co.—all of Kansas City, Mo.

$900,000 Addition, Engrs.—Burns & McDonnell Engr. Co.; Contr.—Interstate Constr. Co., both of Kansas City, Mo.; Ready-Mixed Concrete Supplied by Concrete Materials Co., Kansas City, Kan.

addition in
1954
*same sound practice followed**

*concrete designed for quality...economy with minimum unit water content

When the Kansas City Water Softening Plant was built in 1941, every means was employed to obtain the highest quality concrete most economically. Today's excellent condition of this 13-year old plant testifies to the success of the builders' efforts.

Pozzolith was one of the means used to get these results. Through dispersion of cement it was an aid in producing *lowest unit water content*. The soundness of this practice is shown in the following, from U. S. Bureau of Reclamation Concrete Manual:

"For a given set of materials and water-cement ratio, the unit water content (water required per cubic yard of concrete) is the most important basic factor affecting the quality of concrete". (Page 130, 5th Edition.)

Information showing how Pozzolith will help obtain the qualities you want in concrete sent on request.

POZZOLITH...

the cement-dispersing, water-reducing agent developed by The Master Builders Co. in 1932, makes available the optimum amount of air in concrete and fully complies with the water-cement ratio law. Added at the mixer.

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Subsidiary of American-Marietta Company

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An explanation of your needs written on your business letterhead and a marked map brings you a proposal on our work for you and complete information. No obligation. Dept. PQ-1, Washington Commercial Co., 1200 Fifteenth St. N.W. Washington 5, D.C., ADams 4-8060

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Used Model E Quick-Way trench hoe 24", 4/10 yd. Dragline Bucket 30 ft. Boom on Coleman 4 wheel drive truck with winch in perfect running order. $7000.

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Welded Steel Wing Pulleys

- Self Cleaning—increases conveyor and elevator belt life.
- Maximum strength—minimum weight
  Longer life with welded steel.
- Interchangeable Hubs—Easy Installation.
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- Extra large or non-standard sizes manufactured to order.

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Shovels

RS-2338 (B)—Lima Mdl. 34 Paymaster ¾ cu. yd. Dragshovel w/wide pipeline mounting at 34" flat pads, powered by General Motors 4-71R55 Diesel Engine.
Sale Price FOB Louisville, Ky.....$9,800.00

S-2184 (B)—Lorain Mdl. #77 1½ cu. yd. Shovel with 1¾ cu. yd. Amsco Bucket, Caterpillar diesel engine.
Sale Price FOB Louisville, Ky.....$8,000.00

S-444 (C)—P & H Mdl. 255 (A) ¾ cu. yd. Shovel. Powered by Waukesha Mdl. MZA 86 HP 6 cyl. gasoline engine. Size 4¼x4¾ 404 cu. in. displacement.
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3 ft. TY Traylor Reduction Crusher 7" feed opening. New 1950. Excellent Condition $7150.00

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Model 13B Telsmith Gyratory Breaker. Excellent Condition, 2 @..... 5000.00 each

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1—Brookville—24" Ga.—Gas $3042.
2—G.E. 25 Ton Diesel Electric.
2—Plymouth 8 Ton Gas Std. Ga.
1—Plymouth 8 Ton Gas—30" Ga.
1—Whitcomb 30 Ton S.G. Diesel $40154—almost new.
2—G.E. 44 Ton Heavy Duty Diesel Electric.
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2—BROOKVILLE 12 TON S.G. DIESEL—NEW—BARGAINS. $2683-4.

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21—15 Ton Hopper 36" Ga.
2—Unusually nice 50 Ton Twin Hoppers Cross Dump.

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Southwark 100 Ton Hyd. Press.
Mundy 2 Drum Elec. Hoist—300 H.P.
Browning 25 Ton Revolving Gantry, 230 D.C.
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1—Orton 25 ton Locomotive Crane, Cat D13000 Deisel, 45 ft. boom, 8 wheel, standard gauge.

1—Orton 15 ton Locomotive Crane, 45 ft. boom, electric motor operated, 8 wheel, standard gauge.

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1—7'x120' Vulcan Rotary Kiln
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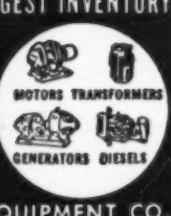

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30 TON INDUSTRIAL BROWN-HOIST GASOLINE OPERATED, 70 FT. BOOM LOCOMOTIVE CRANE, EXCELLENT CONDITION. WITH OUTRIGGERS SELF PROPELLED BOTH TRUCKS.

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Gasoline driven oil field hoist ideal for drag lines. 565 cu. ft. slow speed Allis-Chalmers gas engine, multiple line speeds from 21 feet per minute with 52,000 lb. bare drum pull to 1000 ft. per minute with 2100 lb. bare drum pull. Two drums. Contact:

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BOOMS

60′ Industrial locomotive crane boom, 4x4x3/8″ main angles, boxing at center 34x42″. Wt. 7350#.

50 ton derrick boom 67′ long, corner angles 6x4x7/16″, boxing 24x36″, with 30′ jib boom extension, ball bearing sheaves with bridles & ball bearing blocks for 24 part line.

50′ #6 Northwest crane boom, main angles 3½x3½x3/8″, boxing at center 44½x44½″.

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CRANES, CRAWLER

No. 3 Northwest Crawler Crane, Ser. 4603, gas powered, 40′ boom.

¾ yd. Mdl. 255A P&H Crane, Ser. 8243, gas engine, 30-40′ boom.

¾ yd. LS-85 Link Belt, year 1946, Cat. D-4600 Diesel, 40′ boom.

Mdl. 501 Koehring #1071, 60-70-80′ boom, 18′ jib, Mdl. K Wisc. gas engine, cap. 40,000# @ 12′.

1½ yd. Lorain Mdl. 77 Diesel Crane, Ser. 9163, D-13000 Cat. engine, 45′ to 85′ boom, 20′ jib.

1½ yd. P&H Mdl. 655-A Diesel Crane or Dragline, Ser. 6426, 80′ boom, 20′ jib, Cat. D-13000 eng., hi gantry.

1½ yd. Mdl. K-360 Link Belt, Ser. 1959, Cat D-13000 Diesel, 80′ boom.

1½ yd. Mdl. 78 Lorain Diesel, Ser. 11281, 150 HP Cat. D-13000 Diesel, 70-100′ boom, jib.

PRICES SHARPLY REDUCED ON ABOVE CRANES FOR INVENTORY CLEARANCE.

This Month's SPECIALS

AIR COMPRESSORS, Portable, 2-Stage

500 cu. ft. Ing. Rand #40-H-29551, Mdl. K500, 6 cyl. Wauk-Hesselman Diesel eng., mtd. 4 pneu. tires, hydraulic operated clutch.

600 cu. ft. Chgo. Pneu. Rotary Compressor, Ser. 54400, 6 cyl. Gen. Motors Diesel eng., 4 pneu. tires.

315 cu. ft. Compressors, pneumatic tires, gas powered—Ing. Rand, Le Roi, Chicago Pneumatic.

Air Compressors—Gasoline, Electric and Diesel, from 60 to 600 cu. ft. Includes 360 cu. ft. Ing. Rand electric and 160 cu. ft. Davey electric.

BUCKETS, CLAMSHELL

1½ yd. Owen Type 510020, rehandler, wt. 4750#.

1½ yd. Williams rehandler, wt. 4450#.

1 yd. Owen Type D heavy duty, wt. 4500#.

¾ yd. Williams trench type, wt. 3150#.

¾ yd. Blaw Knox size 673, wt. 3835#.

¾ yd. Owen Type D heavy duty, wt. 3560#.

½ yd. Owen Type D heavy duty, wt. 2960#.

½ yd. Owen Type M Gen. Purpose, wt. 2770#.

⅜ yd. Owen Type M, wt. 1785#.

CAR PULLERS

15 HP Mead Morrison #A-4015, Lincoln motor, 220/3/60, 15,000 @ 45 FPM.

7½ HP Mead Morrison #952, 3/60/220, handle 1 to 5 loaded cars.

CRANES, LOCOMOTIVE

30 ton Mdl. F OHIO #3266, 50′ boom, oil fired, Nat'l. Bd. 200# boiler.

DERRICK, GUY

20 Ton American Terry Steel Erectors Guy Derrick, 110′ mast, 100′ boom, ball bearing foot blocks.

HOISTS, ELECTRIC

80 HP Lambert 3/drum #14712, 3/60/220/440, rated 9,000# @ 225 FPM, steel gears.

Lidgerwood 3/drum #5688, attached swinger, rated 8,000# @ 215 FPM, w/o power.

50 HP American 3/drum, 3/60/220, wt. 10,000#, rated 7500# @ 200 FPM.

50 HP 2/drum Thomas Class A, 3/60/220, wt. 9500#, rated 6,000# @ 250 FPM.

HOISTS, GASOLINE

100 HP 2/drum American, Waukesha gas, 10,000# @ 270 FPM.

80 HP 1/drum Mundy, gas driven, 9,000# @ 225 FPM.

60 HP OK 2/drum #3513, Hercules gas eng., 5,000# @ 250 FPM.

HOISTS, STEAM

12x12 3/drum Lambert-National, 20,000# single line, like new with steel gears & 2 clutch winch heads.

11x12 3/drum American, steel gears, 2 clutch winch heads, rated 15,000# single line.

Lambert steam hoists — 2/drum — sizes 8½x10, 9x10, 10½x12.

8¼x10 2/drum, 9,000# single line, American, Clyde & Lidgerwood.

LOCOMOTIVES

65 Ton American Loco. Co. Diesel Electric Locomotive, Std. Ga., fine shape and a real buy.

6 Ton 24″ ga. Whitcomb gasoline locomotive Type MO 11438, Wisc. VAU gas eng., starter, battery, generator.

MIXER, STATIONARY, ELECTRIC

28-S Jaeger Concrete Mixer #65822, 25 HP electric 220/440/60/3, 100 gal. water tank. Real Bargain.

All this equipment is owned by us and may be inspected at one of our show rooms.

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GOOD buys in USED Truckmixers

We have the Largest Selection of USED TRUCKMIXERS In The Country

12—4½ Yard High Discharge Truckmixers .....Jaeger and Rex
6—4 Yard Horizontal Type Truckmixers...Jaeger and Blaw Knox
6—5½ Yard High Discharge Truckmixers....Jaeger and Ransome
16—5½ Yard Horizontal Type Truckmixers .....Jaeger and Rex
7—6½ Yard High Discharge Truckmixers .....Jaeger
1—8 Yard Horizontal Type Truckmixer .....Jaeger
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ALSO

16—10 Wheel Mack Trucks—Models LF-LJ and LM
8—10 Wheel White Trucks; 1-Federal; 2-Autocars

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SHOVEL, Diesel: P & H 255A, ¾ yd. capacity, 1951 model, like NEW.
SHOVELS, GAS: Lima model 34 Paymaster, 70 ft. boom, and backhoe. Bucyrus Erie 44-B, Wisconsin gas motor, 2 yd. clipper. Rebuilt.
TRUCKS: 8—30 ton tandem Trucks, 300 H.P. Cummins diesel motors, torque converters, 16:00 x 24 tires, excellent condition. Bargains.
BLAST HOLE DRILLS: Bucyrus Erie 42-T with 9" bits, International or Caterpillar diesels, hydraulic jacks, slightly used.
LOCOMOTIVES: 2—65 ton diesel electric, standard gauge, thoroughly modern, excellent condition. For sale or rent.
LOCOMOTIVE CRANE: Link Belt 25 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.
MINE HOISTS: Single and double drum 100 to 1500 H.P., with all electrical equipment. Complete specifications, drawings and photos available.
MINE HOIST SPECIAL: Nordberg 1200 H.P., 1400 FPM, one drum clutched, wraps 1100 ft. 1¾" rope, complete with motor and all auxiliary equipment, with or without 95 ft. head frame.
MINE HOIST MOTOR: 400 H.P., 3 phase, 60 cycle, 2200 volt, 588 RPM, complete with control equipment.
CLASSIFIERS: 4—Akins 54" x 34 ft. with lifting device, 220/440 volt motors. 2—Wemco 78" Simplex, single screw, double pitch, 28½ ft. tank, 220/440 volt motors. All in condition like NEW. 1—Wemco Duplex size 72" x 32 ft., type SH, pitch double and variable, with lifting device, 220/440 volt motor. NEW and UNUSED. Three located Wisconsin.
PULVERIZER: Hardinge 5 ft. x 22" Ball Mill complete with motor driven disc feeder. 30 H.P. motor and control.
JAW CRUSHERS: Sizes 10" x 20" to 48" x 60".

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA.

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Lansdowne, Pa.
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ARCPLATED*
Hardsurfaced Factory Standard Size

	Model	FOB CHARLOTTE, N. C. EXCHANGE Each	OUTRIGHT Each
Allis Chalmers	L	$153.58	$201.57
Buda	6DC5844	210.96	276.88
Buda	6DC51125	345.53	.....
Buda	6DC51879	560.00	.....
Caterpillar	D-7	191.78	251.72
Caterpillar	D-13000	218.40	286.65
Caterpillar	D-17000	382.80	.....
Cummins	H & NH600	213.81	280.82
Cummins	L	755.38	991.42
General Motors	2-71	64.42	84.55
General Motors	3-71	112.80	148.05
General Motors	4-71	125.98	165.35
General Motors	6-71	130.64	171.46
General Motors	8-268A	744.80	.....
International	UD-TD9	102.24	134.19
International	UD-TD14	106.94	140.36
International	UD-TD18	154.17	202.34
International	UD-TD24	235.47	309.04
Mack Diesel	EN707A	158.40	207.90
Waukesha	WAK	205.75	270.04
Waukesha	LRO	519.48	.....

We Buy Used, Uncracked Crankshafts—*Any Undersize*

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Patented Crankshaft Reclamation Process
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***GUARANTEED* MOTORS**
M.G. SETS • GENERATORS
Hoists • Compressors • Transformers
Units of Every Size and Description

SLIP RING MOTORS
3 Phase, 60 Cycle, 220 or 440 Volts (*2200 volts or higher)

HP	MAKE	TYPE	SPEED
2000	*G. E.	MT-30	237
1500	*G. E.	MT-30	240
1250	*West.	CW	600
1000	*West.	CW	250
700	I.A. C.	ANY	720
500	*G. E.	IM	3600
500	*G. E.	MTP	1800
500	*G. E.	MT	450
500	West.	CW	350
400	A. C.	3-brg.	450
400	*G. E.	MT412	450
350	West.	CW	900
300	*G. E.	IM13A	1800
250	West.	HF15H	600
200	G. E.	IM15	100
150	G. E.	MT549 BB	1800
125	*G. E.	MT549	1800
125	G. E.	IM15A	600

WE'LL SELL, BUY OR TRADE
PHONE CANAL 6-2900
CHICAGO *Electric Co.*
1329 W. CERMAK ROAD
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New **RAILS** Relay
Tie Plates—Spikes—Frogs & Switches, etc.
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Stocks at Various Points. Quick Service.

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Railroad Crane. 20 Ton Brownhoist 45' Boom Cast Steel side frame. New Cab. Can be bought with or without Diesel engine. Write for full details to:

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EQUIPMENT FOR SALE

1 40A Marion 2½ yard shovel
1 85 Northwest 2½ yard dragline
1 #5 Northwest 1¼ yard shovel
2 D8 Caterpillar tractors with angle blades
1 315 Portable air compressor
1 414 Adams motor grader
1 Front end loader
1 K-30 rooter
1 Oliver tractor with 72" broom
1 Fuel truck
2 Fourteen yard trucks
Water pumps of all kinds

THE OHIO MINING COMPANY
NELSONVILLE, OHIO
E. A. Cottingham, Manager, Phone 230

15—Stainless Steel Chutes 12' long
15x12 Wms. Hammermill. Never Used
2—Toledo Scales weigh 1 to 50,000#
200 KW Skid Mounted Diesel Elec. Set
4 & 3' SYMONS Cone Crushers
10x24" & 10x36" R.Brg. Jaw Crushers
8' Raymond Mechanical Air Separator
BINS: 8x12' 2-comp. 25 Ton 1-comp.
H. & P., 6719 Etzel • St. Louis 14, Mo.

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6 FT. x 60 FT. ROTARY DRYER

1—ALLIS CHALMERS ½ INCH SHELL ROTARY DRYER, CRADLE ROLLER SUPPORTS, COUNTER FLOW, HOOD & COMB. CHAMBER. LOCATED KINGSPORT, TENN.

DARIEN CORP.
60 E. 42nd St. New York 17, N.Y.

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1—Allis Chalmers Triple Deck Vibrating Screen, 4 ft. x 8 ft., with 7½ h.p. motor, extra screen frames, bearings. Price $1700.00

1—#10 Chambers Automatic Brick Cutter, motor and drive. Price $1500.00

1—Ingersoll-Rand 315 cu. ft. Air Compressor, gasoline driven. Price $2900.00

All items in excellent condition.

UNION MINING COMPANY
1441 Oliver Bldg. Pittsburgh 22, Pa.

FOR SALE

Complete dipping plant, consisting of one 95 ft. steel mast, florey hoist, 2 ¾ yard buckets, bucket carriage, steel blocks and cables, one 650 ft. 1¼ in. cable, 15 ton Fairbanks & Morris scales—two years old. Plenty of guy cables and clamps.

L. C. ILGEN GRAVEL COMPANY
Versailles, Ohio

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Track Accessories
All prices cheerfully quoted.

M. K. FRANK
480 Lexington Avenue - New York City
Park Bldg., Fifth Avenue - Pittsburgh, Penna.
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FOR SALE

1—3' X 6' Grizzly Feeder #5 HM 4 Power Unit 3 Phase, 60 Cycle, 220 Volt with 3½' opening Bought new in 1949.

CATSKILL MOUNTAIN STONE CORPORATION
50 Haarlem Avenue
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Plymouth 35-ton gas locomotive, std. ga.
Telsmith gyratory crusher, 26". Model 25A.
Rotary dryers, kilns, 54"x10', 7'x125'.
Bucyrus 42T blast hole drills (2), elec., 9".
Shovels, draglines, cranes, 1½ to 6 yds.
Euclids, 25 and 15 yd. bottom dumps.
Concrete batch-mix plant, 56-S mixer, etc.
Dredges, diesel, electric, stm., 20", 18", 14".
Cat DW-10 diesel bottom dumps (3).
Bucyrus 2½ yd. shovel attach., 52B-55B.
H. Y. SMITH CO.
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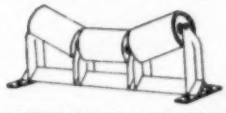
SAVE UP TO 50% ON NEW TROUGHING IDLER CONVEYORS

We take our loss on our stock of short length belting. You save as much as 50% by buying the BONDED CONVEYOR SPECIALS listed with conveyor belting in two pieces. Conveyors are equipped with 20" diam. head pulley, 16" diam. tail pulley, 3-roll, 5" diam. idlers, 1-roll, 5" diam. return rolls and 4-ply, 28 oz. duck, 3/8" top cover x 1/32" bottom cover rubber belting.

Belt Width	Length of Conveyor	List Price	Sale Price
18"	25'	$1229	$ 658
18"	45'	1839	960
18"	50'	2054	1043
18"	85'	3209	1581
18"	100'	3704	1814
18"	130'	4694	2174
24"	25'	1322	739
24"	45'	2062	1085
24"	60'	2617	1355
24"	100'	4097	2037
24"	130'	5207	2606
30"	25'	1421	806
30"	65'	3101	1617
30"	80'	3731	2295

Other lengths and belt widths at bargain prices.

NEW IDLERS AND RETURN ROLLS



FIVE OUTSTANDING FEATURES:

1. Lower in price.
2. Sealed bearings require less maintenance (No greasing required).
3. Replacement ball bearings. Rust proof ball races.
4. All steel construction.
5. Standard dimensions. Interchangeable with other well known makes.

3-roll, 5" diameter Troughing Idlers for

16" belt	$17.25	30" belt	$19.50
18" belt	18.00	36" belt	20.25
24" belt	18.75	48" belt	21.75

1-roll, 5" diameter Return Idlers for

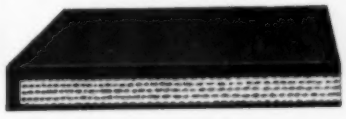
16" belt	$6.75	30" belt	$8.25
18" belt	7.13	36" belt	8.75
24" belt	7.50	48" belt	10.25

Bearings with Alemite fittings still available. Advise type desired when ordering.

NEW CONVEYOR BELTING

New heavy duty rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For boxes, bags, and bulk materials. Troughs easily.

Famous Brands at Deep Cut Prices. Fresh Stock.

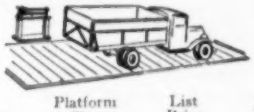


Width	Ply	Top Cov.	Bottom Cov.	Duck Carcass	Price
16"	4	1/8"	1/32"	28 oz.	$2.45/ft.
18"	4	1/8"	1/32"	28 oz.	2.50/ft.
24"	4	1/8"	1/32"	28 oz.	3.23/ft.
30"	4	1/8"	1/32"	28 oz.	3.97/ft.

Additional widths and plies available at low prices. Write for free sample.

NEW MOTOR TRUCK SCALES

Scales have steel lever system complete with structural steel weighbridge.



Capacity	Platform Size	List Price	Sale Price
20 ton	18'x 9'	$849.	$722.
20 ton	20'x 9'	930.	791.
26 ton	16'x 9'	684.	582.
26 ton	20'x 9'	992.	843.
26 ton	22'x 9'	1060.	901.
26 ton	24'x 9'	1135.	965.
30 ton	34'x10'	1997.	1598.
30 ton	40'x10'	2345.	1876.

Others available in lengths up to 60' and capacities to 50 tons.

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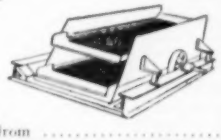
For sizing and separation of Rock, Sand, Gravel, Slag, Coal and many other uses. Shaft is mounted on self-aligning bearings and made in heavy duty eccentric shaft types; 1 to 5 decks, 3'x 8' to 5'x 14'. Others from 2'x 4'. Wire cloth or plate included in price.



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Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders
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Traylor Jaw Crusher, 18" x 36", Type H, Serial No. 49363, Complete with 60 h.p., A.C., slip ring motor, starter, V-belt drive and $1000.00 worth spare parts. Perfect condition, manufactured 1948—put into service 1951—replaced by larger unit 1953. Original cost $21,000.00. Priced complete $10,000.00. Location: Kings Mountain, N. D.

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1—Worthington Wagon Drill, 6 feet drill changes, 4" drifter.
1—3' x 10' Telsmith Triple deck vibrating screen.
2—Atlas Belt Conveyors:
1—14"—40 ft. long;
1—16"—60 ft. long.

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8—6′ x 40′, 5′ x 40′ Ruggles-Coles; 54″ x 25′ Class Xf-4 Ruggles-Coles, also 3—3′ x 50′, 5′ x 50′, 6′ x 60′, 7′ x 70′ Direct Heat. Also 3—6′ x 50′ Louisville Rotary Steam Tube.

3—Link Belt Roto Louvre Dryers—#207-10 (2′7″ x 10′); #502-16 with all stainless steel contact parts; #604-20.

3—3′ x 50′ (or Coolers) made by Bonnot Co., Canton, Ohio.

ROTARY KILNS:

1—6′ x 120′ Vulcan Rotary Kiln.

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Jaw—2″ x 6″, 6″ x 15″ Sturtevant, 18″ x 36″ and 24″ x 36″ Farrel; 42″ x 48″ Traylor; Rolls; 42″ x 16″ Allis Chalmers Type B; 24″ x 32″ Penna Single Roll. Portable Plants; Cedar Rapids 1016-BBB; 2540-AAAA, 2036-AA, Also Pioneer with 30″ x 42″ primary and secondary Crushers, all Diesel driven.

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1—#5047 Raymond High Side Mill.

2—#6669 Raymond Super Mills

6—#1, #0, #00, #000 Raymond Mills.

3—#0, #00, 8″ Raymond Screen Mills

2—#51 Raymond Imp. Mills

3—Mikro #4TH, #2TH, Bantam SH

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6—Hardinge Mills, 3′ x 8″, 5′ x 22″, 6′ x 22″, 8′ x 48″.

4—Tube Grinding Mills, Made by Traylor, E. & M. Co. Allentown, Pa. Silex Lined, 4″ x 11′, 4′6″ x 18′6″, 5′ x 22′ and 5′ x 26′.

8—Pebble Mills, porcelain lined; 3—6′ dia. x 8′, 800 gals. each. 1—6′ x 5′, 3—5′ x 4′, each with ball charge.

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3—#12 Sweetland Pressure Filters, each with 48 bronze Monel covered leaves on 3″ C.C., ea. 642 sq. ft. f.a., 56 cu. ft.

All sizes Oliver Rotary Vacuum Filters.

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Gruendler 6XD Pulverizer Late Model—Ser. #17412 In excellent working condition.

$7,500.00

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Enclosed Hummer screen, type 31, 6′x5′
Universal vibrating screens, single & double deck
Hummer type 37 single deck screen, 3x5 V16 vibrating with 1 KW generator
Plato type 50 vibrating screen, 42″x72″ double deck with stand, belt driven
Selected lot of screen cloth, assorted sizes
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3—10″ Rotary Feeders with ¾ hp gearmotors
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Enclosed elevator, 64′ center, 8″x5″ buckets
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Robins double roll crusher, 18″ dia., 24″ face
Penna. SXT-8 hammermill
Stedman hammermill, 24″ dia., 30″ face, type B36
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Replacement buckets for elevators of all sizes
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1—26,000# Vulcan, Sgl Drum AC with MG Set Complete
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1— 5,000# Link-Belt Carspotter AC
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SINGLE SHELL: 4'x20', 4'x40', 6'x40' & 6'x60'
KILNS: 6'x60', 6'x80', 8'x125', & 10'x125'.

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NEWHOUSE 7", 10", 14"—KENNEDY 19S, 25S, 37—SUP. McC. 6" & 10" AL. CHAL. 322R, 223R, 530R, TRAYLOR TY 36".

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1—62' cc., 42" x 18" buckets, Continuous.

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7' x 160' x ⅝" (2).
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4'6" x 50' x ¼" with lifters.
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4' x 10' Seco, double deck.
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14" x 13" Worth. Compr., 628 CFM, 100 PSI.
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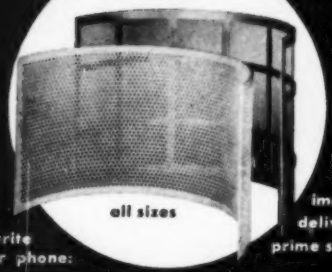

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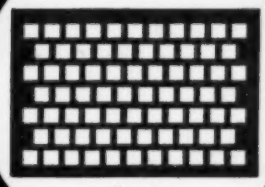

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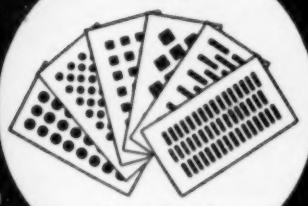

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